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The AUTOMOBILE

British Designers Aim at Increased Motor Efficiency

Parts Lightened by Using Better Materials Giving Greater Economy—Carbureters Improved—Cone Clutch Gaining—Worm Drive Falling Off

Engineers Are Giving More Attention to Accessibility, Silence and the Bodily Comforts of the Passenger—Easy Brake, Oil, Carbureter and Fuel Adjustments Featured

LONDON, NOV. 13—*Special to* THE AUTOMOBILE—British tendencies for the 1913 season as brought out at the Olympia show illustrate the fact that design has become more standardized during the past year than ever before. Almost without exception refinements are minor in detail. A close study of the trend shows that with very few exceptions the makers are confining their efforts to one or two models.

Refinements in materials and workmanship have brought the motors up to a high state of economy. Lighter materials are used for the piston and connecting-rods in some of the cheaper motors. The use of two and three-ring pistons has increased. Passing back to the chassis features it will be seen that the cone clutch is gaining in popularity torque members are fitted with better connections, several makers have abandoned worm drive for the carefully made bevel drive. Worm and sector steering holds its supremity, while front-wheel brakes are on the decline, although one prominent firm has interconnected the front and rear brakes.

British Tendencies Revealed at the Olympia Show

1—An increase of small chassis
2—Decrease in the six-cylinder cars
3—Wire wheels holding their own
4—Cone clutch gaining in popularity
5—Four-speed gearsets on 60 per cent. of cars
6—Sleeve-valve motors have not increased
7—Average horsepower remains the same
8—Worm drive abandoned by some makers
9—Splash oiling used in cheaper motors
10—Front-wheel brakes declining
11—Use of silent chain for magneto drive
12—Underslung rear spring in use
13—50 per cent. of cars have thermo-cooling

Although there is probably less change in motor design this year than in any other previous year as is evidenced by the fact that the average horsepower for both four and six-cylinder cars remains practically the same and the Knight and other sleeve-valve motors have made no prominent advance, a study of some of the more prominent types will be of interest.

The Swift Motor Company, Ltd., Coventry, is confining its attention for 1913 to the output of three new four-cylinder types of the popular R. A. C. ratings, 10.5, 12.0, and 20.1 horsepower. In the new 10 horsepower model, the bore and stroke of which are 65 by 100 millimeters, respectively. The cylinders are formed in a single casting, with the valves on one side, actuated by adjustable tappets, and inclosed by an aluminum cover. The ignition is by magneto only, while on the left-hand side of the engine an oil tank is cast integral with the crank chamber, this oil tank being large enough to hold sufficient oil for 400 or 500 miles. Lubrication is by splash, the feed to the crank chamber being automatic without the use of pumps or any other moving devices. As soon as the level in the crank chamber falls below a certain point, oil automatically starts to feed, stopping when the proper level is reached.

There is a commodious dome for conveying the thermo-syphoned water from the cylinder jacket to the radiator. Above the oil is the exhaust manifold. This takes the form of a ribbed casting having a rectangular section passage. Eight studs hold it upon the cylinder casting. The aluminum door enclosing the valve stems, etc., is a flat plate and assists well in silencing the motor.

The 12-horsepower model which the Swift company introduced during the 1912 season has chiefly been altered in regard to chassis dimensions, that is to say, the tread is wider, the wheelbase longer, while the body itself has been made proportionally larger. The engine has a bore and stroke of 75 millimeters by 110 millimeters, R. A. C. rating, 13.9. The cylinders are cast in pairs mounted on an aluminum crank chamber. The valves are on the left side and thoroughly inclosed. Adjustable tappets with hardened steel rollers are actuated by a chain-driven cam-

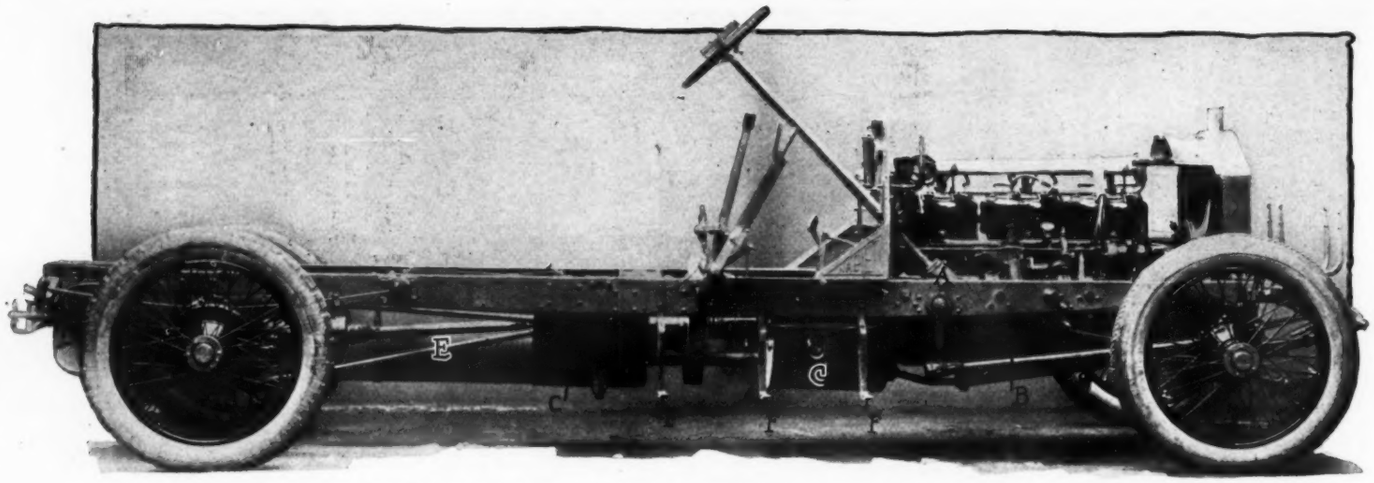

Fig. 1—45-horsepower, six-cylinder Napier chassis. A, steering adjustment; B, reach rod; C, oil pans; F, step hangers; E, torque member

shaft, the chain in question being fitted with a type of adjustment adapted to allow of any back lash being taken up automatically. Ignition is by Bosch high-tension magneto mounted in a very accessible position on the right side of the engine. Cooling is of the thermo-syphon type, the inlet and outlet pipes being of large dimensions and again the cylinders and valve pockets are most generously water-jacketed. Honeycomb type of radiator is supplied, while the fan behind the latter is driven by means of a flat belt off the camshaft.

The means of automatically oiling the engines has been carefully thought out so as to combine reliability with simplicity of detail. The oil is transmitted through the oil sump by means of a centrifugal pump driven vertically from spiral gears off the camshaft and circulated by pressure to the main crankshaft bearings. A by-pass from the delivery pipe is extended to the dashboard where a sight-feed indicates the working of the pump. The oil delivered through the sight-feed above mentioned being then distributed to an oil bath in the timing cover. It should be stated that the timing chain is kept constantly lubricated by running through the oil bath in question. A gauze filter is fitted between the base chamber and sump and an outside pocket is cast to the latter which contains another filter easily detached for cleaning purposes. A gauge cock for indicating the normal level of the oil in crank chamber is supplied.

The Adams Manufacturing Company is confining itself to a single chassis for 1913, the motor of this chassis being of 16-20 horsepower. It has four cylinders 88 millimeters diameter by 120 millimeters stroke, which closely represents average English practice. The cylinders are cast in pairs and the valves are upon one side of the engine. Three bearings only are employed for the crankshaft. The crankpins are 60 millimeters long. A noticeable feature is that no rollers are provided for the tappets, which have, however, a large diameter. The water jackets are very ample providing for the thermo-syphon cooling system. There is a certain amount of water space between the cylinder pairs and the cylinder top ends are spherical and to provide additional strength are ribbed as well. Light detachable doors cover in the valve mechanism.

The oil pump is driven from the same vertical shaft as the air starting distributer. It is placed low and its wheels have wide teeth. Noticeable features are the extra large scoops on the connecting-rods which dip at each crankshaft revolution into the troughs below the cylinders.

Bosch high-tension magneto ignition is in use and the magneto is located at the forward end of the engine close to the air compressor.

The new B. S. A. chassis possesses some points of interest, but confining our attention to the motor, it will be observed that the Daimler-Knight type of engine is employed. The bore is 75 millimeters and the stroke 114 millimeters.

It is of some interest to notice that the cylinders are off-set, a practice that is not very usual with sleeve-valve engines owing to the very low position periodically taken up by the inner sleeve which must consequently be considerably cut away for connecting-rod clearance. In this case it will be noticed that the inner sleeve has a groove to clear the connecting-rod when at extreme angular position, though the cylinders are not more than 12 millimeters out of center.

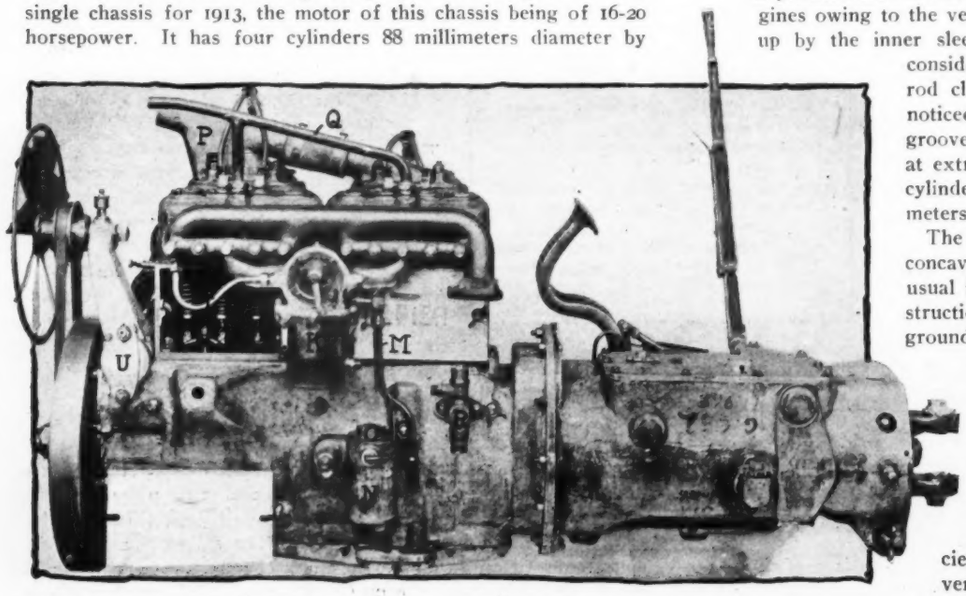

Fig. 2—Napier motor. U, cover plate; K, carbureter; N, O, oil pump; M, oil by-pass; P, Q, water outlets

The pistons which are fairly light have concave tops, which, though perfectly usual in engines of this or similar construction, are objectionable on the grounds of the possible collection of lubricant. The aim of the designer is doubtless to get a spherical or nearly spherical explosive chamber at or shortly after the commencement of the stroke when the temperatures are highest, and there can be no doubt that from a thermal efficiency point of view the aim is a very excellent one.

The trough system of lubrication is in use, the troughs being pivoted

to the caps of the main bearings and are connected up to the throttle lever so that the oil supply may be in proportion to the work done. A small plunger pump is provided for filling the trough with oil. The plunger has a diameter of 8 millimeters. Immediately behind the pump connecting-rod is a rod which oscillates a small cylindrical valve for mechanically regulating the flow of oil into and out of the pump.

The Belsize 15.9-horsepower motor is an attempt to compete with the American low-priced car. The cylinders are cast en bloc, with ample water jacket between each pair. The casting is, however, very much simplified by the fact that the cylinder heads form another casting which is studded in one piece onto the top of the cylinders. The two castings have their faces machined and copper asbestos washers are interposed. The cylinder dimensions are: diameter 69 millimeters and stroke 130 millimeters.

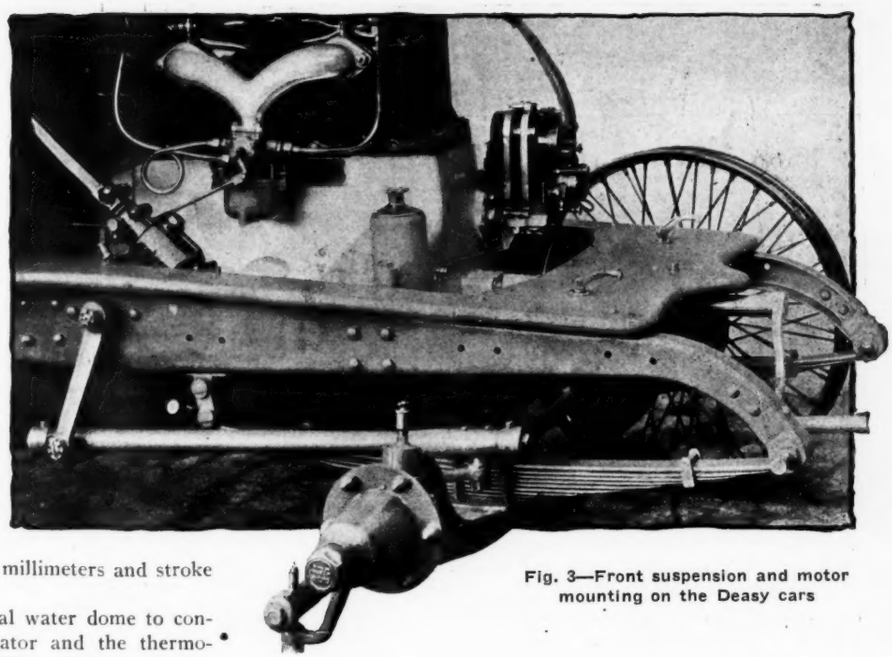

Fig. 3—Front suspension and motor mounting on the Deasy cars

The cylinder head casting has an integral water dome to conduct the water into the top of the radiator and the thermo-syphon system has been depended upon. The cylinder walls are 6 millimeters thick, and the top of the combustion chamber is 7 millimeters thick and is slightly convex to assist strength.

The pistons are very light and have convex ribbed tops. The length of the piston is 85 millimeters and the lower or skirt part is drilled out to effect a further saving in weight. Two rings only are provided, so that the gudgeon pin can be positioned rather high, and this has the effect of slightly reducing the overall height of the engine. The gudgeon pins have a diameter of 19 millimeters and have 14 millimeter holes drilled through them.

The connecting-rods have a length of 293 millimeters and are very light stampings indeed, the central web being only 3 millimeters thick. The crankshaft journals as well as the crankpins have a diameter of 38 millimeters and the crankpins are 50 millimeters long. The crankshaft journals from the forward end have lengths of 44, 60 and 60 respectively, and the bushes are lined with white metal. The crankwebs have a thickness of 18 and 19 millimeters. Owing to the fact that the cylinders have good water spaces between them and that the crankshaft bearings have a distance between them from bush to bush of only 156 millimeters it has been necessary to overhang the connecting-rod big ends to an extent which is not in accordance with the best practice. The center line of the rod corresponding with the center of thrust pressure is two-sevenths of the crankpin length from one end of the pin—and five-sevenths of course from the other. While a symmetrical bearing is doubtless preferable, it is quite usual to find even twice as much bearing surface on one side of the connecting rod center than the other, but seldom is there so much overhang as that just mentioned. The good length of the connecting rod will to some extent compensate.

Large oil troughs are arranged over the crankshaft bearings, and troughs for the dippers on the connecting rods to draw a supply from. Attention should be drawn to the oil pump; this is of the gear-wheel type and works in a horizontal position at the extreme bottom of the crankcase, and it has a vertical driving shaft which takes its motion from the camshaft. The driving shaft is square at both ends so that the pump can be withdrawn without releasing any coupling bolts or other fastenings. In the center of the tray that supports the connecting rod troughs there is a very commodious filler through which all the oil must pass before it can again enter the pump and be distributed to the troughs. This filler can, moreover, be withdrawn bodily from the bottom of the case or the foul oil may be removed by means of the screw-plug shown. The connecting-rod dippers are large and present a good surface to the oil in

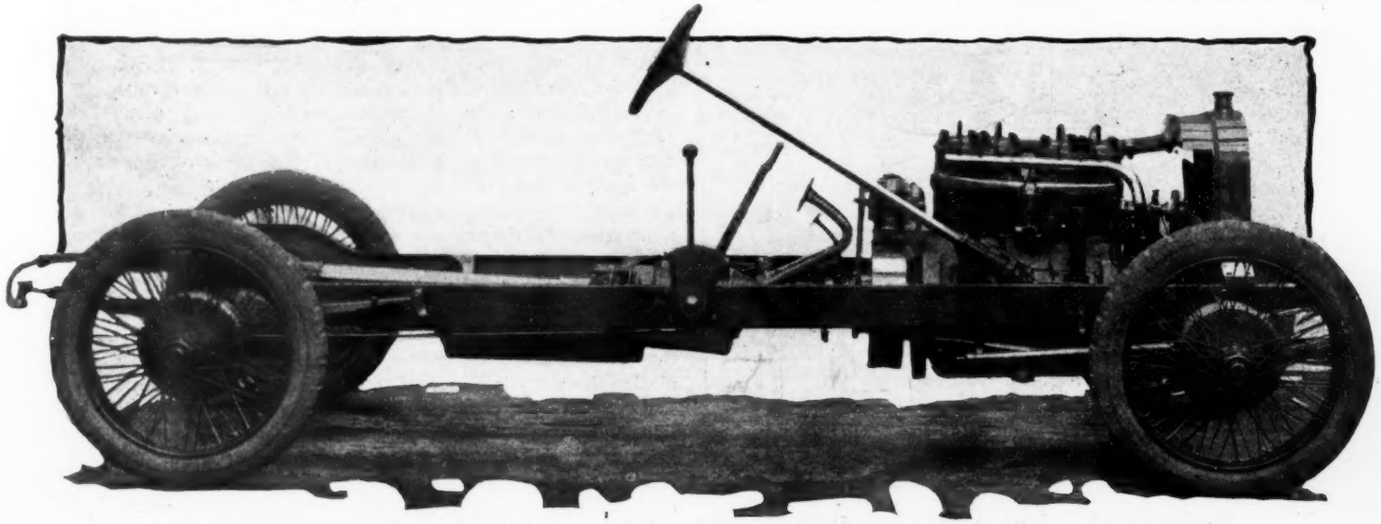

Fig. 4—Chassis of the 25-horsepower Argyle. Note the simple exterior of motor given by sleeve valve construction

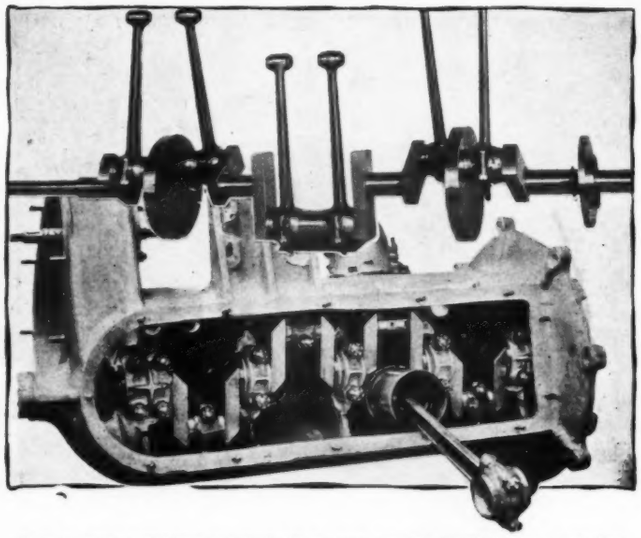

Fig. 5—Six-cylinder crankshaft in use on the Talbot cars and the 15-horsepower Crossley crankcase

the troughs at each revolution, and from the results obtained with the Daimler-Knight adjustable trough system, with its knife-edge dippers, one would expect a great quantity of oil to be thrown up and in view of the fact that the piston skirts are perforated some of this oil may well reach the combustion chamber. It may be for this reason that the ignition plugs are screwed into the valve-caps so that their electrodes lie back in a comparatively deep recess.

The valves, which are all upon one side of the engine, are no more than 28 millimeters in diameter, and this must be considered small at a time when a few good engines have valves with diameters below the seat equal to about half the cylinder diameter. However, there is no doubt that many engines with comparatively small valves do give good power and are capable of running at high speeds. The valve stems have a diameter of 9 millimeters and the guides are long ones.

In discussing the valves the length of the valve springs should be noted. These are, from end to end when in position, nearly 2.75 inches long. The valve tappets are of very simple construction; there are no rollers, the tappets having merely rounded ends and being furnished at the top with hard steel caps. There is perhaps some advantage in the no-roller tappet in that the guide can be brought down very close to the cam—it need, in fact, only just clear the top of the cam—so that there is little bending action on the tappet and a lesser tendency to wear the guide than would otherwise be the case. The length of the tappet guide is 70 millimeters.

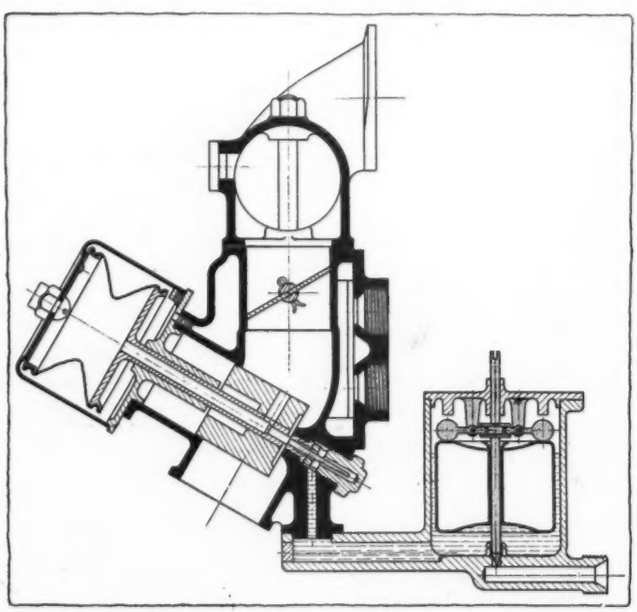

Fig. 6—The C-W. carbureter used on the Wolseley cars. Gasoline connection to the right

The camshaft has a diameter of 19 millimeters and has three bearings, one of which is divided into two, to make place for the chain-drive wheel. The cams are cast solid upon the shaft and have a width of 13 millimeters. It will be gathered from the small width of the chain wheels that they are intended for roller chains in place of the more usual silent pattern chain. The chain wheels are of steel and are solid disks in each case. A small spring-controlled jockey pulley serves to maintain the correct degree of tension. The chain is of course completely enclosed and compares quite favorably with the silent pattern of chain from the point of view of silent running. The valve springs, tappets, etc., are enclosed, light steel metal doors being fitted over them, the doors being held in place by thumb nuts.

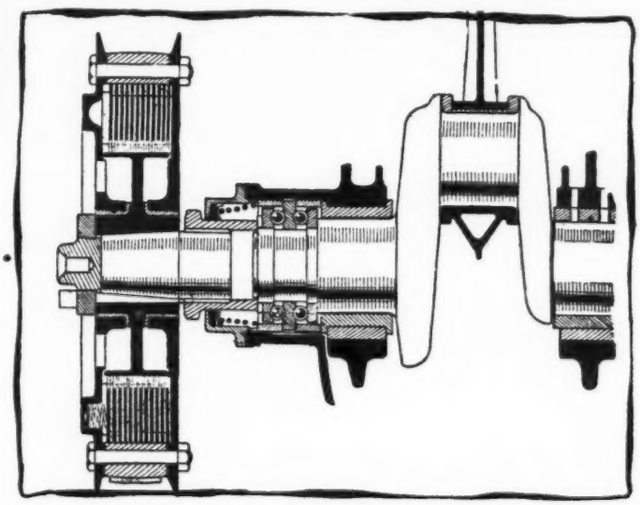

Fig. 7—Lanchester vibration damper to eliminate synchronizing of vibration periods on six-cylinder motors

The fan runs on ball-journal bearings placed 95 millimeters apart and has a diameter over the blades of 305 millimeters. The exhaust manifold is ribbed and has a jacket to provide warm air from the carbureter.

The carbureter employed is the Claudel-Hobson automatic type, and so economical is the running of the engine with this that 30 miles to the gallon is claimed.

In place of the Darracq 14 horsepower a 16 horsepower has been substituted; the bore and stroke are 85 by 130 millimeters. This model and the 12-horsepower have the rotary valve.

The cylinders are cast monobloc, which is typical of all Darracq constructions, with the exception of the 22 horsepower, the cylinders of which are cast in pairs. The Zenith carbureter is employed with all models, the Darracq company evidently finding it advantageous to fall in with the general system of leaving the matter of carburetion to specialists. The rotary valve (Henriod system) is driven by chain, also the magneto and pump, on the opposite side to the rotary valve.

Probably the point of success in this engine is due to the masking of the valve by the piston. At the top of the stroke the piston entirely covers the port so that at the time of explosion the valve is protected from the effect of combustion. The Darracq firm are evidently quite satisfied with the results obtained during the past year inasmuch as they are applying this valve mechanism to two types. It is claimed that over one hundred parts are discarded by the use of this valve as against the ordinary poppet valve. The rotary distributer is mounted on ball bearings.

Both Humber models have monobloc cylinder castings, and they are very perfect examples of intricate and difficult core work. The inlet and induction pipe are cast together in the form of a cover plate which fastens on to the cylinders with eight studs. These castings also form a water-jacket cover plate.

With the Humber cars careful attention has been paid to lubrication. The pump is situated in the oil sump itself, and is driven by spiral gear from the camshaft, and arranged at the flywheel end of the engine. A conduit is cast in the crankcase from which the oil flows to the main bearings, and the big ends are lubricated through the crankshaft. Instead of the usual pressure gauge an indicator of the plug type is fitted to the dashboard. As long as the plug is projecting from its socket the oil circulation is active.

The Maudslay motor has undergone but little alteration for the coming year. The bore is 90 by 130, and is the only British motor which is fitted with overhead valves. The cylinders are cast in pairs, but united, forming a continuous waterjacket. Both pairs are cast to one pattern. The front end waterjacket coverplate is utilized to carry a bracket within which is formed a bearing for the vertical shaft, and also supports the fan spindle bracket. The vertical shaft is driven from the crankshaft by worm gear which again transmits the motion to the horizontal camshaft over the cylinder by similar gearing.

The camshaft and valve stems are totally enclosed, but free access is obtained to the valves by the cover being hinged, a universal joint applied to the vertical shaft, making it possible to hinge over the cover with the camshaft and its bearings. Between the cover and the valve stems a thrust lever is interposed in which feltpads are so arranged that a film of oil is brought between the cam and the lever. The bearings of the camshaft are provided with ring oilers.

The magneto is driven by means of a chain, and the oil pump is driven from a lower extension of the vertical shaft. The pump is of the rotary type, and forces oil to the main bearings, and thence through the drilled crankshaft.

A feature in connection with the Maudslay engine is that the pistons can be removed through the base chamber, the circular doors being provided for this purpose.

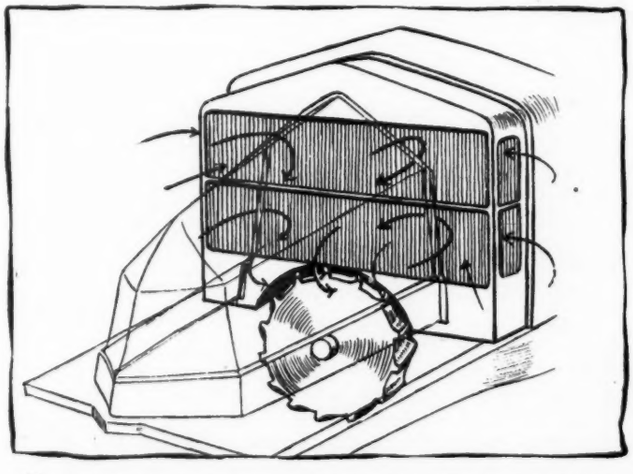

Fig. 9—Diagrammatic view of the cooling system in use on the Deasy cars

The design of the engine readily lends itself to the construction of a six-cylinder, by the addition of another pair bolted to the end flange. The crankshaft has five bearings on the four-cylinder model.

The dimensions of the cylinders on the Bell motor are 3.5625-inch bore by 4.75 stroke. Helical gearing is employed for driving the camshaft, magneto and water pump. All valves are set in line. The crankshaft is set in three bearings, and has a diameter of 1 5-8 inch. The crank bearing at flywheel end is 3.625 inches long, the center bearing 2.625 inches and the starting end 3.125 inches. The pins are 2.125 inches in length.

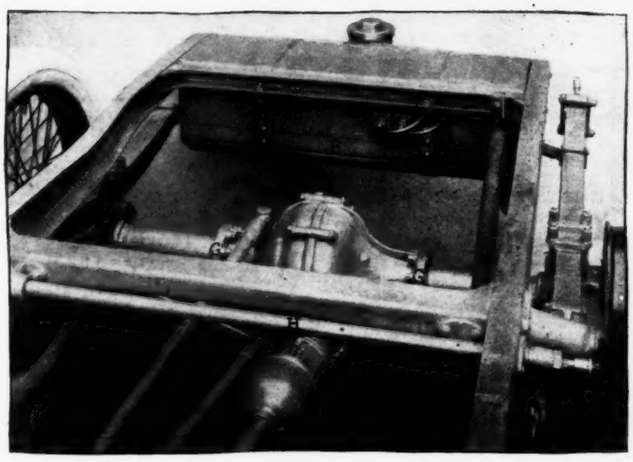

Fig. 8—End view of the Napier 15-horsepower chassis. Note mounting of tank F, crosspiece H and torque connection G

The crankcase is made in three parts. The two main castings are bolted on the center line of the crankshaft, the lower half of the bearing being supported by the lower casting. The third portion of the case forms the bottom and carries the oil troughs and sump.

The lubrication system of the Bell cars is interesting by reason of the arrangement devised for giving a varying amount of oil to the connecting-rods. The rotary oil pump is fixed to the upper half of the base chamber and driven by spiral gear from the camshaft. The oil is first pumped to an indicator on the dashboard, and then feeds the oil continuously to pockets situated over each main bearing, and also to troughs under each connecting-rod. A foot valve is fitted at the end of the suction pipe and a priming fitting to ensure satisfactory working. On the dashboard is fixed a lever working in a quadrant which is coupled to a rod operating a lever coupled to sluice gates fixed to the side of each dripping trough. By operating the lever on the dashboard the sluice gates can be raised or lowered, thus alternating the level of the oil in the troughs. This arrangement is similar to that employed by the Daimler company, except that in the case of the Daimler arrangement the troughs are hinged, and are raised or lowered by a connection to the throttle of the carbureter.

The Vauxhall program comprises two models so far as the main features are concerned, a four-cylinder car having cylinders 90 by 120 millimeters and a six-cylinder car having cylinders of the same dimensions. In the case of the four-cylinder engine the cylinders are cast en bloc. This construction is par-

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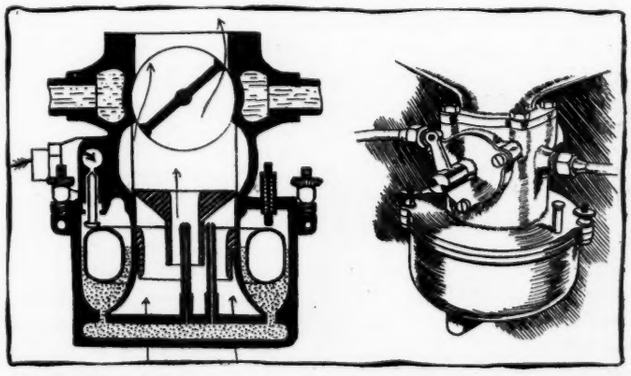

Fig. 10—Sectional and exterior views of the 1913 Deasy carbureter

Equity Rules Hit at Patent Law Abuses

Supreme Court Eliminates Waste of Time in Pleadings and Saves Millions of Dollars to Litigants in Costs by Simplifying Procedure in Chancery so that Comparatively Poor Patentees Can Establish Rights—In Force February 1

PATENT litigation, and in fact recourse to the courts of equity on broader lines, has become so extremely expensive through the cumbersome system in effect that litigants without long purses and the ability to wait have been at a real disadvantage. In fact, the adjudication of many a valuable patent has been abandoned when the patentee learned something of the necessary costs and interminable delays that have been associated with patent litigation. **Therefore, the Supreme Court of the United States has just issued a new set of equity rules that is pronounced by the bar to be the most revolutionary document of the American republic since the Emancipation Proclamation.**

The operation of the new rules will serve to shorten patent litigation fully 50 per cent. on the average and will reduce the costs to a mere fraction of what has been usual. **Under the new rules, according to William A. Redding, chief patent counsel for the Automobile Board of Trade, the great Selden suit could have been disposed of in 6 months instead of 5 years, and that the testimony that filled thirty-six volumes, at a minimum cost of $1 a page for publication alone, could have been contained in one volume.**

The new rules will require more actual ability and much more energy on the part of counsel because of the strict provisions limiting the scope and time for pleadings. Even more important is the rule that requires the bulk of the testimony to be taken in open court under the strict rules of evidence. This rule will eliminate a tremendous amount of irrelevant, incompetent and immaterial testimony.

At the time the final decree in the Dick Mimeograph suit was handed down by the Supreme Court, last summer, THE AUTOMOBILE treated on some of the ideas outlined in the dissenting opinion of Chief Justice White. It was in the form of a symposium specially written by William A. Redding, S. O. Edmonds and John R. Taylor. These gentlemen made certain suggestions about equity procedure in general and specifically pointed at patent practice, and the new rules cover the various points suggested with remarkable accuracy. Of course, they cannot affect procedure in the patent office itself which must be covered by Federal statute, but they do reform court actions along the most radical and progressive lines.

The least fee charged for prosecuting a simple patent suit through the United States District Court is $2,000. From that price the scale runs up to $100,000. As the costs are reckoned with the fee, the saving to litigants under the new rules will be a very material item. The net revenue of counsel will not suffer, for while the attorneys will have to move faster, with the result that they will spend fewer days on a given case, they will have more time to devote to litigation.

Comparatively poor men, owners of valuable patented ideas, will have a better chance to enforce their rights, no matter what the power and wealth of their adversaries.

The new rules are astonishingly brief, numbering eighty-one all told. Patent procedure under them will be reduced, as briefly outlined below. **Upon the actual filing of the bill of complaint, the clerk shall issue the process of subpoena thereon. There is notice contained in the subpoena that the defendant shall file his answer in court, on or before the expiration of 20 days after service. If service is accomplished and the answer is not filed, the complainant is entitled to a decree pro confesso.**

Final decree may be entered at anytime after 30 days subsequent to default.

Save where the existing statutes provide for certain technical forms of pleading, all such technical forms are abolished in equity. As to amendments the rules state that the court, at every stage of the proceedings, must disregard any error or defect in the proceeding which does not affect the substantial rights of the parties.

Exceptions to bills of complaint for scandal, impertinence or redundance are barred but the court upon its own initiative or upon motion may strike out such extraneous matter upon its own terms.

Lack of equity has always been a standard plea where, entirely aside from the facts and law involved, the party advancing that plea wished to be given more time. The usual procedure was to allege that while the opposite party might have an action at law, the facts showed that the suit should have been brought on the law side rather than in equity. The Supreme Court adjusts this difficulty by providing for the peremptory transfer of cases brought in equity that should have been brought in law and orders that only essential changes shall be made in the forms of pleadings and provides that matters ordinarily determinable in law, incident to a suit in equity, shall be determined according to the principles applicable to the case without sending it to the law side of the court.

This might seem to the layman to be an unimportant detail, but the facts of the case are that this rule may prevent delays of as much as a year in a given suit and expenses running into real money.

The form of the bill of complaint is much simplified. The new form will have five sections; the caption; brief statement to give the court jurisdiction; the facts relied upon by the plaintiff, omitting all matters of evidence; exceptions in joinder in the action and a prayer for relief.

Under rule 29, demurrers and pleas are abolished. This means that one of the chief sources of delay in equity is eliminated. All the defenses that are now presented by way of demurrer or plea must be included in the answer instead of being pleaded in succession at intervals of at least 30 days. The effect of the rule will be to make the drafting of bills of complaint much more careful because some technical mistake might lead to the dismissal of the suit by reason of demurrable fault.

The rule provides for hearing of motions to dismiss on the part of the defendant but specifies that if the motion is not successful, answer must be filed in 5 days on pain of a decree pro confesso.

The issue is joined on the defendant's answer, which must be short, omitting matters of evidence. The answer may state as many defenses as are deemed essential, regardless of consistency. General denials must be avoided. Averments except as to value, if not denied shall be deemed confessed.

Matter that heretofore has been used as the basis of cross-bills, must be pleaded in the answer. Unless some counterclaim is set up in the answer, no further pleadings are required. If such counterclaim is alleged, the plaintiff must reply to it within 10 days.

Exceptions for insufficiency of an answer are abolished; thus eliminating another source of delay. Such objections in the future will be handled as part of the suit itself.

The most important change in the rules is the substance of rule 46, which reads:

"In all trials in equity the testimony of witnesses shall be taken orally in open court, except as otherwise provided by statute or these rules. The court shall pass upon the admissibility of all evidence offered as in actions at law. When evidence is offered and excluded, and the party against whom the ruling is made excepts thereto at the time, the court shall take and report so much thereof, or make such statement respecting it, as will clearly show the character of the evidence, the form in which it was offered, the objection made, the ruling and the exception. If the appellate court shall be of the opinion that the evidence should have been admitted, it shall not reverse the decree unless it be clearly of the opinion that material prejudice will result from an affirmance, in which event it shall direct such further steps as justice may require."

Where depositions are allowed in exceptional cases or ordered by statute in patent cases, those of the plaintiff must be filed in 40 days; those of the defense in 20 days more and rebutting depositions within 15 days thereafter. Cross-examinations are ordered to be held in open court where the opposite party desires such a right.

When the time for taking depositions has expired the case goes on the calendar automatically. Postponement of the hearing may be had on application of counsel, but the adjournment of the hearing may not go beyond the end of the trial term.

Save in matters of accounting, reference to masters in chancery shall be the exception and not the rule.

The form of decrees is much shortened and simplified, the Supreme Court ruling that the pleadings, reports of masters and other prior proceedings shall not be recited.

On appeal to the United States Circuit Court of Appeals, the rules require brevity and relevance on pain of having the costs of irrelevant and redundant matter taxed against the party at fault in order to discourage such practice. The rule places the attorneys within its scope and the court is ordered to issue rules against offending members of the bar even when their clients are not held to be amenable.

The old rules of equity are abrogated and the new set effective as of February 1, 1913.

The rule as to the taking of testimony in open court, the omission of printing voluminous records and the simplification of appeal procedure will undoubtedly save millions of dollars a year to litigants.

Under the new rules, the owner of a patent enters suit against an alleged infringer. He files his bill; subpoena issues and service is had. This may occupy a day or a week, rarely the latter. When 20 days have expired the defendant must answer and the suit will be at issue. In patent cases the plaintiff has 40 days to file depositions; the defendant 20 days to answer with another contingent delay of 15 days where rebutting depositions are required. The case is then ready for trial and may be heard within 30 days after the time for filing depositions has expired. **The operation of the new rules would seem to limit a patent action wherein there are no unusual features to 125 days from the time of filing until the trial. In many instances it would appear that cases might be finally heard in 50 days and that 6 months would be about the maximum limit unless something exceptional developed.**

Under the present rules, the answer may be reached in 80 days after the filing of suit, but it may be delayed almost indefinitely by the interposition of dilatory pleas, demurrers and other pleadings upon which issue of the merits of the case can not be joined. The taking of testimony may occupy almost any reasonable amount of time and the rebuttal testimony may still further delay the hearing. The witness to be examined gives his testimony before a master, who has no discretion as to its admissibility. He must transcribe it for the court's use and it becomes a part of the record. As such it is printed at high cost.

The testimony put up to the trial judge is generally an appalling mass. If he is to do his full duty he is obliged to wade through reams of inconsequential stuff. When he has heard the arguments, he must take the briefs of opposing counsel and the testimony of both sides and mull them over until the equity involved becomes clear to his mind.

For that reason alone many cases are reversed in the upper court. There are so many irrelevant documents imposed upon the court and such a terrific mass of conflicting data is developed at the ordinary trial of even the simplest patent litigation that the chance of disordered proportion is always present.

It is almost axiomatic that skillful counsel can delay action in a patent case almost indefinitely, but such will not be the case under the new rules. The limits are clearly defined and in future it will be a remarkable patent case indeed that will linger in the courts pending a hearing for so much as 1 year.

Of course, the new equity rules will not affect the operation of the Patent Office. That must be done by Federal statute. The Oldfield revision of the patent laws died an unmourned death when the late session of Congress adjourned. The measure may be revived next fall, but those nearest to the project are least optimistic.

Unless consideration of it is included in the call that may be issued for an extra session of Congress after President Wilson is inaugurated, it is not likely that the measure will come up until the regular session convenes, if then.

In fact, future action on the subject of revising the patent laws is in the hands of the President's Commission on Economy and Efficiency.

This commission has issued forms containing twenty-four pertinent questions as to prospective changes in the law and all over the country members of the leading associations of lawyers are considering the queries. The New York County Lawyers' Association, which includes many of the leading patent attorneys of the country; the American Bar Association and the aggregations of patent lawyers here and elsewhere have been busy with research work which will probably form the basis of revision when it actually takes place.

Such revolutionary measures as the Oldfield bill are not favored by the majority of the associations. They state that they favor unanimously the enactment of patent laws that will make for speed, certainty and efficiency. The methods by which these three elements shall be joined are the subjects under discussion.

The whole subject of patent law making is extremely technical and patent rights are so firmly founded upon the Constitution that a radical law might have the effect of raising the basic constitutional question every time a patent suit is presented. The careful consideration of proposed laws by the bar associations will probably result in the elimination of a lot of waste, so far as the time of legislators is concerned.

The question of competent examiners; of one or two appeals within the Patent Office itself; of the limitation of the life of a patent to 19 years from the time of filing application; of the whole subject of interferences; of the Constitutional provision awarding exclusive rights to the patentee and the limitation of those rights; the use of unpatented materials and the resale price feature are all subjects of deep interest—too deep, in fact, to run the chance of hasty action by partisan law makers.

U.S. Motor Sale Date Set

Court Orders Property To Be Sold January 8 and Reorganization Plans Have Progressed to Final Form

Grabowsky Power Wagon Company in Receivers' Hands, But No Order of Adjudication Has Been Entered

UNDER decree of the United States District Court, the United States Motor Company will be sold January 8 in New York. Judge Charles M. Hough signed an order to that effect on Monday when the final form of the decree of sale was submitted to him. This form was not substantially different from what was outlined in these columns last week, the changes being of a trifling character.

Under the decree, formal bids for any one or more of the six parcels into which the assets have been divided may be submitted, accompanied by an earnest of good faith in the shape of cash or certified check. The bids thus submitted may be revised upward at the option of the bidder at any time before the closing of the sale at 3 o'clock of the day set.

The action of the creditors appears to be practically unanimous as to the acceptance of the proposed plan of reorganization. On Monday, November 18, 94 per cent. of the claims, based upon the total amount, had been filed with the official depositary, the Central Trust Company. It was announced that at least 4 per cent. more would probably be filed by December 9, which day has been set as a limit for deposit.

This means that of a total of over $11,000,000 of claims, the reorganization committee now has all but $660,000, and has prospects of getting the co-operation of about $450,000 before the expiration of the deposit period.

The Flanders project is reported to be progressing favorably, although no official word of its consummation has been given out. The contract has not been signed but there is a thorough understanding between the parties. This agreement is substantially the contract outlined in these columns last week. The precise details have not been disclosed but it may be said with certainty that the deal is conditioned upon the acceptance of the presidency of the prospective company by Walter E. Flanders as well as the merger of the Flanders company.

It is likely that the situation will be sufficiently developed within 3 weeks to make the official announcement, despite the fact that the date of sale is still 7 weeks in the future.

The deposits of stock are now estimated at over 47 per cent. and according to the prevailing opinion, the total percentage that will come in on the assessement plan will be somewhat more than a majority, considering both issues as a whole.

Oliver Reorganization Consummated

DETROIT, MICH., Nov. 18—All the property of the defunct Oliver Motor Car Company has been purchased from the receiver by a recently organized company known as the Oliver Motor Truck Company. G. A. Meyer is president: F. J. Meyer is treasurer; and R. F. Beach will have charge of the sales. It is the intention of the new company to manufacture the Oliver 1,500-pound light delivery car and the 3,000-pound type, with a few changes made for the betterment of these machines.

Receiver Named for Grabowsky

DETROIT, MICH., Nov. 19—Despite any statements to the contrary the Grabowsky Power Wagon Company has not yet been adjudicated a bankrupt, although a petition recently filed by several of the creditors of the concern in the Federal Court in Detroit will probably result in such action. Judge Tuttle appointed the Federal Trust Company receiver.

It is the intention of the receiver to conduct the business temporarily and in the event the court orders a sale it is hoped that it can be made as a going business. This order may be given the latter part of this week.

Several concerns have shown an interest in the matter and are preparing to make a bid on the business. Rumor has it that the Alco people have an eye on the proposition and in other quarters it is stated, that the General Motors Company is also looking it over. It is impossible to verify these reports.

Federal Truck Had a Good Year

DETROIT, MICH., Nov. 16—The Federal Motor Truck Company passed a stock dividend of $100,000 and declared a cash dividend of 10 per cent. on November 14. This company was incorporated 3 years ago for $100,000, and has enjoyed a prosperous business since that time. Its output has increased from fifty trucks during its first year to 135 the second, and 750 for 1912. For the coming season, it is expected that about 1,500 will be sold. The officers of the company are: T. E. Reeder, president; Edwin Denby, vice-president; Garvin Denby, treasurer, and M. L. Pulcher, general manager.

Body Company in Receiver's Hands

LAPORTE, IND., Nov. 18—John C. Richter has been appointed receiver of the Laporte Carriage Company, of this city, giving bond of $10,000. The receiver was appointed in the federal

Automobile Securities Quotations

AUTOMOBILE securities were strong during the past week. Sales were not large because buyers declined to advance bids sufficiently to bring out the stock in material quantities. United States Motor issues were quoted regularly for the first time since the reorganization plan was formulated, although the issues have been dealt in irregularly for some time. The bids were 8 for the common; 32 for the second preferred and 65 for the first preferred. The trading was not brisk. Goodyear was again the spectacular feature of the trading, advancing 12 points on a few bids and making a new high record of 412. Chalmers broke 20 points on two small trades. This stock is very closely held, little of it being on the market, and consequently the usual supporting orders are not present. The table:

	1911 Bid	1911 Asked	1912 Bid	1912 Asked
Ajax-Grieb Rubber Co., com	..	..	180	200
Ajax-Grieb Rubber Co., pfd	..	..	98	102
Aluminum Castings Co., pfd	..	..	100	102
American Locomotive, com	36½	36¾	47	47½
American Locomotive, pfd	102½	103	106⅜	108
Chalmers Motor Company	..	..	125	145
Consolidated Rubber Tire Co., com	7	10	11	14
Consolidated Rubber Tire Co., pfd	10	20	50	60
Firestone Tire & Rubber Co., com	175	180	285	288
Firestone Tire & Rubber Co., pfd	107	109	105½	107
Garford Company, preferred	..	..	99	100
General Motors Company, com	37½	38½	35	36
General Motors Company, pfd	77	79	76¾	78
B. F. Godrich Company, com	240	245	71	72
B. F. Goodrich Company, pfd	118½	119½	107	107¾
Goodyear Tire & Rubber Co., com	230	240	412	415
Goodyear Tire & Rubber Co., pfd	104	106½	104½	105½
Hayes Manufacturing Company	..	..	..	90
International Motor Co., com	..	..	20½	22½
International Motor Co., pfd	..	..	74	78
Lozier Motor Company	..	..	..	45
Miller Rubber Company	..	..	143	147
Packard Motor Company, pfd	104½	106	105½	107½
Peerless Motor Company	..	..	115	120
Pope Manufacturing Co., com	40	45	26	29
Pope Manufacturing Co., pfd	66	70	71	73
Reo Motor Truck Company	8	10	8¾	9½
Reo Motor Car Company	23	25	19	21½
Studebaker Company, common	..	..	42	44
Studebaker Company, preferred	..	..	94½	96½
Swinehart Tire Company	..	..	99	101
Rubber Goods Mfg. Company, com	85	95	100	..
Rubber Goods Mfg. Company, pfd	100	105	105	108
U. S. Motor Company, com	*18	*19	†8	‡10
U. S. Motor Company, pfd	*62	*64	§32	‡38
	..	..	¶65	‡70
White Company, preferred	..	..	105	108

*Old. †Common. ‡New. §2nd preferred. ¶1st preferred.

court by Judge Albert B. Anderson at Indianapolis. The receivership was created on the application of the Lackawanna Leather Company, of Chicago; the Hackettstown National Bank, of New Jersey, and M. M. Kates, of Chicago.

In addition to the application for a receiver a petition was filed asking that the carriage company be declared a bankrupt. The company manufactures automobile bodies and buggies. According to the complaint the company became embarrassed by losing a large contract it had with the Mitchell Motor Company. It was pointed out in court that the company's profits in 1910 aggregated $28,000, but in 1911 it lost $15,000 and up to the present time in 1912 its losses have been $35,000.

Henry Hess Sells to D. W. F. Company

Announcement has just been made that the D. W. F. Ball Bearing Company, of Germany, has purchased the interests of Henry Hess in the Hess-Bright Company, of Philadelphia. Mr. Bright will continue with the company and will direct its policy. He has been elected president. The new secretary of the concern will be A. T. Bruegel and the treasurer, C. L. McCalla.

The Hess-Bright Company has been the American representative of the D. W. F. concern for a long time, importing the German bearings and manufacturing a number of domestic products.

The sale indicates still closer relations with the American trade by the German manufacturers, but is in nowise a revolutionary move. The interests have been closely allied in the past. The domestic manufacturing program has not been announced.

Market Changes for the Week

THE past week saw quite a few changes. The chief topic in the crude rubber trade on Tuesday was the auction sale of plantation rubber in London. This went off at higher prices, fine up-river Para closing at $1.07 per pound, a gain of $.03. The market for linseed oil was easy owing to the decline of late in seed at Duluth, where prices again weakened on Tuesday, closing at $.52, a loss of $.06. Lard oil increased $.06; petroleum, Pennsylvania, crude, rose $.10, while cottonseed oil also rose $.16. Tin lost $.02, owing to poor trade, and lead also experienced a decline, closing at $4.60 for a loss of $.15. Antimony remained at $.09 1-4 until Tuesday, when it dropped $.00 1-4. Beams and channels, Bessemer steel and open-hearth steel remained constant throughout the week.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Change
Antimony, per lb.....	.09¼	.09¼	.09¼	.09¼	.09¼	.09	—.00¼
Beams & Channels, 100 lbs...	1.61	1.61	1.61	1.61	1.61	1.61	.....
Bessemer Steel, ton	28.00	28.00	28.00	28.00	28.00	28.00	.....
Copper Elec., lb.....	.17⅜	.17 9/20	.17 9/20	.17 9/20	.17½	.17½	+.00 1/10
Copper, Lake, lb.....	.17⅜	.17⅜	.17⅜	.17⅜	.17⅜	.17⅜	.....
Cottonseed Oil, Nov., bbl.....	5.87	5.87	5.87	5.85	5.87	6.03	+.16
Cyanide Potash, lb.	.19	.19	.19	.19	.19	.19	.....
Fish Oil Menhaden)	.33	.33	.33	.33	.33	.33	.....
Gasoline, Auto, 200 gals. @..	.21	.21	.21	.21	.21	.21	.....
Lard Oil, prime.	.90	.90	.90	.90	.90	.96	+.06
Lead, 100 lbs...	4.75	4.72½	4.72½	4.72½	4.72½	4.60	—.15
Linseed Oil....	.58	.55	.55	.55	.55	.52	—.06
Open-Hearth Steel, ton.....	28.00	28.00	28.00	28.00	28.00	28.00	.....
Petroleum, bbl., Kansas, crude....	.73	.73	.73	.73	.73	.73	.....
Petroleum, bbl., Pa., crude ...	1.70	1.75	1.75	1.75	1.80	1.80	+.10
Rapeseed Oil, refined	.69	.69	.72	.72	.73	.70	+.01
Rubber, Fine Up-river, Para.	1.04	1.04	1.04	1.04	1.06	1.07	+.03
Silk, raw Ital...	....	4.40	....	....	4.40	....	.....
Silk, raw Japan.	....	3.85	....	....	3.92½	....	+.07½
Su'phuric Acid, 60 Beaumé....	.99	.99	.99	.99	.99	.99	.....
Tin, 100 lbs....	5.00	5.04	5.00	5.00	5.00	4.98	—.02
Tire Scrap.....	.09¾	.09¾	.09¾	.09¾	.09¾	.09¾	.....

Nash G. M. President

Buick Executive Succeeds Thomas Neal as Head of Giant Company—Latter To Be Chief of the Board of Finance

Neal's Administration Remarkably Successful in Rehabilitating Property and Establishing Firm Footing

DETROIT, MICH., Nov. 19—Thomas Neal, who for the past 2 years has been president of the General Motors Company, has relinquished that office and will become chairman of the board of directors. C. W. Nash, manager of the Buick plant and one of the vice-presidents of the company, will succeed Mr. Neal as president. Mr. Neal's retirement is in accordance with an understanding at the time he took office.

In the fall of 1910, according to a statement given out by the company today, when the concern was re-financed and the executive offices moved from New York to Detroit, the financial interests supporting the company realized the necessity of securing as president a man of very broad business experience, capable not only of exercising the abilities of an organizer and the judgment of an experienced manufacturer, but also of inspiring confidence among investors and financiers. Mr. Neal was urged to take the office and accepted with some hesitancy. Although he was attracted by the great possibilities offered to one interested in large business enterprises, his acceptance necessitated close application to executive work at a time when he was desirous of being rid of such burdens.

Mr. Neal took the office with the understanding that he would be permitted to retire as soon as the business was re-established on a satisfactory basis. The financial report of the company recently issued to stockholders shows that this time is ripe and that the business is in splendid financial condition with a net earning of 17 per cent. on the common stock during the last year.

At the meeting of the stockholders of the General Motors Company held Tuesday in Jersey City all the old directors were re-elected, save in the case of J. N. Wallace, who retired and was succeeded by Charles W. Nash. The annual report as already published in these columns was presented. The board will meet again to choose officers for the coming year.

The directorate consists of the following: Joseph Boyer, Anthony N. Brady, Emery W. Clark, W. C. Durant, Andrew H. Green, Jr., J. H. McClement, Edwin D. Metcalf, M. J. Murphy, C. W. Nash, Thomas Neal, James J. Storrow, Albert Strauss, Nicholas L. Tilney and Jacob Wertheim.

The board contains the same representatives of the financial interests that took hold of the company after 1910.

Charles W. Nash was elected president of the corporation at the subsequent meeting of the directors.

Mr. Nash succeeded W. C. Durant as general manager of the Buick after the reorganization and will continue in that special capacity. Thomas Neal, retiring president, will remain on the board and will continue as head of the finance committee.

The various changes signify that the affairs of General Motors are progressing regularly and that the pressing need for a financial and industrial specialist at its head has abated. Mr. Neal made a wonderful success of his administration. Mr. Nash is a manufacturer of pre-eminent rank and is highly regarded as an executive.

W. C. Durant, who was re-elected to the board was not present at the meeting as he had been called to Detroit on business connected with his new manufacturing project. The attendance at the meeting of the stockholders was small in numbers but represented practically all of the capital stock issues.

Ward Heads King Co.

Buyer of Plant Is Chosen President—Bayerline, Bollinger, Chase and Day Are Members of His Staff

Freight Car Shortage Situation Improves as Peak of the Load Approaches—Only 1200 Increase

DETROIT, MICH., Nov. 16—Following the visit of Artemus Ward to this city to look over his new property, the King Motor Car Company, which he purchased for $40,000, it is announced that the reorganized concern will be a close corporation, all of its stock to be held by Mr. Ward and those actively engaged with him in the enterprise.

Artemus Ward, Jr., son of the new owner of the King company, will spend much of his time here. His father is to be president of the company. The personnel of the concern in addition to Mr. Ward is: J. G. Bayerline, manager; T. A. Bollinger, factory manager; T. P. Chase, engineer; J. B. Siegfried, purchasing agent; W. L. Daly, sales manager; J. Mohardt, superintendent; F. A. Vollbrecht, chief accountant and Geo. Gurney, manager service department.

The present line of four-cylinder cars will be continued, in addition to which another model will soon be placed on the market to sell at a figure close to $1,200. This latter machine is really the one which Mr. Bayerline, who was formerly connected with the Warren Motor Car Company, built last summer. It was designed by Mr. Chase under direction of Mr. Bayerline.

The new King company has shipped forty-three cars since it was taken over 5 weeks ago by Mr. Ward. A production of about three cars a day is now being maintained. A show room will be opened at the factory on Jefferson avenue within a short time.

Frontier Company's Annual Report

BUFFALO, N. Y., Nov. 18—At the annual meeting held here Friday of the stockholders of the Frontier Tire & Rubber Company, officers were elected for the ensuing year. Orson E. Yeager being chosen president, while Frank V. E. Bardel and John W. Gibbs were chosen first and second vice-presidents respectively. George T. Roberts was elected treasurer, while M. F. Dirnberger, Jr., was elected secretary with A. R. Robertson as assistant secretary and treasurer. W. R. Price was selected as general manager for the coming year. During the past 6 months the business of the Frontier Tire & Rubber Company was reported to have increased 140 per cent. About $600,000 worth of business already has been closed up for next year according to the report.

Freight Car Shortage Less Severe

Net shortage of automobile freight cars only increased about 1,200 during the fortnightly period just reported by the American Railway Association which ended November 7. The total net shortage at that time was 51,259. Compared with what was predicted, this is a smaller shortage than expected by at least 8,000 cars and indicates that the peak of the load is being passed right now. The next report covering the period ending November 21 is expected to show a decrease to about 40,000 cars net shortage and by the first report in December the traffic men believe that there will be demand for only about 20,000 more cars than can be supplied. By the second report in December the operating departments of the roads will probably have a few idle cars over and above the full quota in use.

The reduction of the shortage in coal cars represents most of the improvement in the situation so far as the grain from the Northwest is moving in still larger volume than heretofore. It has been shown that fully 100,000,000 bushels of grain in excess of the shipments of 1911 up to this time has been moved to primary markets. The visible supply of wheat alone is placed at 22,000,000 bushels, a record that will stand for a few days anyway. Reckoning 1,000 bushels to the car, the extra grain shipments so far this year have been 100,000 cars. As a matter of fact, the average car will not carry 1,000 bushels, so the actual excess total is even larger.

There has been little congestion, considering the immense volume of freight handled, as the weather has been good for shipping all over the land.

Compared with last year, when there was a net surplus of freight cars totalling 26,514, present conditions indicate an increase of freight for shipment of about 79,000 cars.

Among the railroads that placed rush orders for cars last week were the Northwestern, Omaha, Lackawanna and Ontario and Western. The orders amount to 3,000 cars. The total number of cars ordered during the week is estimated at 13,400, while about 30,000 are included in inquiries made by the Pennsylvania, New York Central lines and smaller systems, orders for which have not been placed as yet.

The grain movement of the past week was about double that of last year for the corresponding period.

Warren Creditors Extend Notes

DETROIT, MICH., Nov. 20—(*Special Telegram*)—At the request of the directors of the Warren Motor Car Company, creditors and officers of the company held a joint conference at the Pontchartrain hotel on November 19, at which it was decided to extend all notes and other obligations until about June 1. The creditors were unanimous in their opinion that the Warren company is in healthy enough condition to continue business. On November 12 another joint meeting was held at which the exact condition of the company's affairs was gone over.

The liquid assets are about $375,000, under the new arrangements, while liabilities total $350,000, of which $50,000 is a stationary liability against the plant, leaving sufficient margin for conducting business.

Although the plant has not been operated at its full capacity of late, it is expected that within 2 weeks it will be turning out its maximum output again.

Cars to take care of 2 months' business are ready for shipment at once, while the entire 1913 output of 1,500 machines have been sold, which will take care of the business up to July 1 of next year. The various models will be continued as planned.

At yesterday's meeting six were added to the directorate from among the creditors, which number added to the present officers will bring the board up to nine. The enlarged board is made up as follows: Harry Bassett, Weston Mott Company; H. J. Mallory, Weston Mott Company; F. H. Lewis, Lewis Spring and Axle Company; M. R. Jencks, Port Huron Engine Company; J. W. Mowe, Firthstone Tire & Rubber Company; G. Jahn, Bosch Magneto Company; Homer Warren, C. R. Wilson and C. H. Wilson.

On Thursday afternoon, November 21, a meeting of the directors will be held at which the resignation of several of the present officers will be accepted and new ones elected.

Postmaster Prepares for Parcels Post

Postmaster Morgan, of New York, is preparing his department for the prospective rush of mail matter under the new parcels post law which goes into effect January 1. The parcels business is handled at present by the express companies and with the transference of this business to the postoffice vast additions to the present transportation facilities of the departments will be required.

Just how much it will amount to is a matter of guesswork and the department will probably await the event itself before

entering into hard and fast contracts for transportation. The package mail during the holidays is always large even at the present high rates of postage, and Mr. Morgan intends to try out the parcels system beforehand by handling the Christmas parcels. The method to be used will be to hire automobile trucks and horse-drawn wagons for the occasion.

The aggregate mail under the parcels post law probably will not be much larger than it was last year, during the first few weeks of the law's operation, but any increase will be felt almost instantly in New York and the department figures that an accurate gauge of the situation can be had from noting local conditions.

The general department has not yet contracted for automobile trucks to be used in the outlying sections where it is expected that the new law will make rural deliveries much more laborious than they have been in the past.

The bids asked by the government to furnish certain types of automobile trucks specified several sizes that would be useful for this purpose, but, on the surface at least, the specifications were not aimed at mail delivery cars.

Finger Prints on Drivers' Licenses

BUFFALO, N. Y., Nov. 18—Superintendent of Police, Regan, of Buffalo, is heartily in favor of the plan recently outlined by State Secretary Lazansky, of recording finger prints of all chauffeurs and automobile owners to prevent gangsters and gunmen from securing licenses. "Of course, many owners might object to giving their finger prints," said Chief Regan, "but after the advantage of the plan is shown I believe the majority would be willing." There are no two finger prints alike while many faces look so similar that identification is difficult.

Bathtub Case as Limit to Patents

WASHINGTON, D. C., Nov. 18—A decision of the Supreme Court of the United States which marks an epoch in connection with efforts to violate the Sherman anti-trust law by concealing the violation behind the patent laws of the country, handed down on Monday, in the "Bathtub" case from the United States District Court of Maryland, was a victory for the government throughout. The opinion, which was delivered by Justice McKenna, was unanimous. The government, in originating the case, attacked the enameled ware manufacturers on the grounds that the fifty defendants named had entered into a combination to restrain interstate trade in sanitary enameled ironware, and had attempted to monopolize that trade. The prosecution was based on an agreement between the defendants and Edwin L. Wayman, who had patented a dredger, a tool employed to sprinkle enamel over the red hot iron ware, which agreement, it was alleged, constituted an illegal agreement.

The lower court held that the agreement destroyed competition and fixed prices in violation of the Sherman law, and, furthermore, that the patent on the dredger did not make the agreements lawful. Justice McKenna said the combination of the manufacturers became effective through Wayman's plan to grant license on his patent. The agreements clearly therefore he continued, "transcended what was necessary to protect the use of the patent or the monopoly which the law conferred upon it. They passed to the purpose and accomplished a restraint of trade condemned by the Sherman law. The added element of the patent in the case at bar cannot confer immunity."

Justice McKenna said there was nothing in the "mimeograph case" of last year which contravened the views he was expressing. He said:

"Rights conferred by patents are indeed very definite and extensive, but they do not give any more than other rights to universal license against positive prohibitions. The Sherman law is a limitation of rights which may be pushed to evil consequences and therefore restrained."

A. C. A. Must Pay Debt

U. S. Supreme Court Holds That Unregistered-Corporation Defense Is Not Valid in Lupton Suit

Opinion Gives Jurisdiction to Federal Courts Even Where It Is Specifically Denied Under Statute

THE status of the foreign corporation which fails to register under the laws of the State of New York has been further outlined by the recent decision of the United States Supreme Court in the suit of D. Lupton Sons & Company against the Automobile Club of America for damages under a contract by the former to funish a large bill of goods and labor to the club. This consisted of metal window frames and other merchandise and the labor necessary to install the material.

The matter was tried in the United States District Court before a master, who decided that the complaint was not duly founded because the Lupton company was a Pennsylvania corporation which had not complied with the New York statute providing for registration with the Secretary of State.

The matter was then taken to the United States Supreme Court on revision, and that court reversed the finding of the master, sending the cause back to the district court with a mandate to enter a judgment in favor of the complainant for about $3,000.

The constitutionality of the whole statute was not covered by the opinion, but the rule was sufficiently outlined so that it has been established that while the statute is valid and in effect within the jurisdiction of the state courts it has no force in the Federal tribunals. While it is optional with a foreign corporation whether it shall prosecute a suit in the state of Federal courts, the rules of Federal procedure provide that the United States courts shall not take jurisdiction of any matter in which lass than $2,000 is involved. Thus, if the foreign corporation, unregistered in New York, wishes to enforce a claim of less than $2,000 it is powerless to do so. If it is over $2,000 it may do so in the Federal courts. Of course, if the corporation is registered it can proceed under the jurisdiction of the state courts. Scott, Upton & Newcomb argued the matter for the Luptons.

Court Again Defines Joy-Riding

MILWAUKEE, WIS., Nov. 18—A point of law was established in a case tried at Milwaukee last week which will make it possible to collect damages from the persons or person responsible for taking a car without the owner's consent for joy-riding or other purposes. The W. E. Allen Company, state agent for the McFarlan and Marathon, brought suit against Robert Leonard and five others for damages due to the misuse of a car. Leonard was employed in the Allen garage and took out a touring car, a demonstrator, and invited five friends to go riding, and in the early hours of the morning landed the car against a pole.

Allen's attorneys proceeded against both driver and passengers on the ground that concerted use was made of the car and that all were guilty of conversion. Not only was claim made for repair cost, but for depreciation of the car's value brought about by such repairs.

The court decided that the driver alone could be held liable, excusing the four defendants who were passengers. However, the fifth passenger, who did not appear at the trial and was not represented by counsel, was held jointly responsible for this error of omission, with the driver. Judgment was rendered against both. Had the fifth defendant appeared he would have been excused from liability.

Atlanta's Show Opens

Prospects Promise Well with Cotton High and Plentiful and Finances of South in Fine Shape

Machine Tools To Be a Feature of the New York Automobile Show—Boston Electric Club Reorganized

ATLANTA, GA., Nov. 16—The Atlanta show, third in the Gate City of the South, and the second under dealers' auspices, was opened tonight. Thirty-two branches and agencies are exhibiting cars and accessories. The exhibit was divided as follows: gasoline pleasure cars, seventy-eight; electrics, seven; commercial cars, six; polished chassis, four; accessory exhibits, eight; oil exhibits, one and motorcycles, five.

Considerably more space was available than last year 30,000 square feet as against 18,080. This increase of space in the local Auditorium-Armory was accomplished by raising the floor to the level of the stage, by tearing out the wings of the stage and by utilizing to the fullest extent the space under the seat banks.

The showing of automobiles is comprehensive and representative. Fifteen of the most important automobile manufacturers in America are represented in Atlanta with branches and as many more are represented by agents, with the result that the Atlanta show each year usually offers a good assortment of standard cars.

The cars are better displayed than usual this year. The tendency to overcrowding has been avoided and the display is excellent.

Atlanta's position in the South is shown by the number of factory representatives who are here for the show. Included in the list are the following notables: H. O. Smith, president Premier Motor Manufacturing Company; C. P. Henderson, president Henderson Motor Company; Jas. G. Haislet, chief engineer, Studebaker Corporation; Leo A. Peil, general sales manager, Mitchell Motor Car Company; E. W. Morse, sales manager Hudson Company; J. H. Newmark, advertising manager, Oakland Company; Guy Monahan, advertising manager, Premier Motor Manufacturing Company; W. C. Leslie, general manager Firestone-Columbus; Henry Haven, assistant sales manager, Flanders Electric; R. W. Chapman, assistant sales manager, National Motor Vehicle Company; H. C. Beavers, assistant to the president, Stevens-Duryea; R. H. Collins, general sales manager, Buick Motor Company; James T. Roach, sales manager, Locomobile Company, of America; W. J. Slater, assistant sales manager, Michigan; in addition to practically every southern division manager in the field.

Little can be told of the volume of business which will be transacted during the show, but there is every reason why it should be large. The South is most prosperous this fall—and in that respect a different Dixie from last fall, when pauper prices for cotton put the entire section to the bad. This year cotton is plentiful, the price is vastly higher than a year ago and in every respect there is ample reason why Southerners should have money. Unless the opinion of the show optimists is wrong, more cars will be sold this year at the show than at both previous shows put together.

Machine Tools at National Show

Machine tools will be featured at the coming national automobile show in New York, special emphasis being laid on commercial vehicle week, when the intense crowding of pleasure car week has passed. The Automobile Board of Trade conferred last week with the National Machine Tool Builders' Association and an agreement was reached.

The Society of Automobile Engineers favors the addition of machine tools to the big show and according to the plans now being formed the examination of the prospective exhibits by members of that organization will be one of the attractions of the annual meeting's program.

Secretary M. L. Downs is now in Cleveland arranging some of the essentials of the added attraction. According to tentative plans the machine tool exhibit will be housed in the Palace and efforts are being made to have it as complete as possible, considering the comparatively short time that remains between now and show time.

The show will be the first ever given by this section of the industry and as the national show always brings together the cream of the mechanical staffs of the various automobile factories, its importance to the manufacturers is great.

Without giving out any definite data it has been announced that the total exhibits already signed up for the New York show during both weeks is 9 per cent. greater by number than actually showed in both buildings last year.

Boston Electric Club Reorganized

BOSTON, MASS., Nov. 18—Boston electric automobile dealers and allied interests changed the name of their organization from the Electric Vehicle Club of Boston to the Electric Motor Car Club, of Boston, at a meeting held at the Hotel Marliave, November 14. The committee on reorganizing through its chairman, F. J. Stone, reported a new constitution and by-laws which were adopted after discussion.

The principal feature of the new constitution is the division of membership into three classes, namely:

Those who derive an income resulting from the sale of electric automobiles and accessories.

Private owners and operators and their representatives.

Representatives of the trade or daily journals.

The constitution also provides a financial basis for making the club self-supporting. Provision is made for the appointment of standing and working committees to advance the interests of the organization.

Following the evening's business, John A. Voodry delivered an address on "Salesmanship" in which he outlined his opinions of the cardinal points in selling electric cars. F. D. Stidham spoke of the need of a complete list of charging stations for the Boston territory.

The advisory committee of the club was directed to confer with representatives of the Bay State A. A., Massachusetts A. C. and other bodies of motorists relative to the present stringent enforcement of the ordinances regarding the leaving of cars on public streets. It was suggested that a petition of motor car owners be prepared for presentation to the proper authorities to protest against these regulations.

The officers of the reorganized club are as follows: President, Day Baker; vice-president, E. S. Mansfield; secretary, H. F. Thomson; treasurer, J. S. Codman.

Savannah Negotiating for Races

With regard to the reports originating in Savannah, Ga., that application will be made for the 1913 running of the Vanderbilt Cup and Grand Prize road races, William K. Vanderbilt, Jr., of the Motor Cups Holding Company, has announced that nothing definite has been decided about the running of the races.

The terms proposed by the Savannah Automobile Club contemplates full entry lists for both events as a condition precedent to accepting them. Under the tentative plan suggested, the club asks for half the net proceeds, the rest going to the military organizations that guard the course.

RICHMOND, VA., Nov. 16—The Richmond Automobile Club has completed arrangements for 2 days' racing meet to be held at the State Fair Grounds on November 29-30, following the Virginia-Carolina football game on Thanksgiving Day.

Foreign Cloth In Discard

American Makers of Trimmings and Upholstery Coverings Now Rival Product of French and German Factories

Minor Details of Workmanship Still To Be Perfected at Home Before Supremacy Is Established

THE American car buyer has every reason to feel gratified that he is now able to obtain direct from manufacturers in this country quite what he desires of medium priced upholstery goods for his car. And should the manufacture of automobile cloth and laces continue to progress during the next few years as it has unmistakably progressed during the past 5 years **there will be scarcely any class of upholstery fabrics which cannot be obtained from the American manufacturer, except perhaps the trimming designed for an exclusive line of limousines.**

Not a few domestic manufacturers are now supplying the market with automobile upholstery fabrics of a particularly varied line which in tastefulness and real elegance of effect fairly rival the most popular French designs.

American cloth manufacturers and lace producers are working in cordial co-operation in an effort to equal, if not to surpass, the product of the foreign manufacturer. These home manufacturers expect to show—indeed, they are even now showing—samples of cloth and lace harmonious and luxurious in design and effect. In this matter, up to a comparatively recent period, the foreign manufacturer has been clearly in the lead of his American competitor. **No longer need we to look to the French and German cloth and lace makers' products for those seemingly matchless cloth and lace effects.** The manufacturers of our own country are now producing cloths and laces which in design and quality, and in those other fine points of distinction, are nothing short of what the European manufacturer is able to bring forth.

What the American car, when upholstered, chiefly fails in is the proper proportion of upholstery design, in those infinite minor details of workmanship, and in the variety, extent and quality of the essential furnishings.

The Paris samples of upholstery workmanship bear the stamp of an artistic touch combined with a thorough appreciation of all the little niceties, both of workmanship and material, which enter into the finished car. In this respect, and only in this respect, do the Frenchmen excel the artificers and designers on this side of the Atlantic. Practically every French craftsman is a master in arranging and providing for the pleasure and comfort of the car occupants in the matter of interior conveniences ordinarily overlooked by the American artisan. This is a part of automobile construction and finish that the craftsmen in this country must be permitted by their employers to learn fully.

But, after all, these are minor issues compared with the supreme one of providing a car interior furnished with cloth and laces, and a style and design of upholstering, sufficient to meet the demands of the most fastidious traveler.

The French cloth and lace makers were first to introduce the practice of matching laces with standard colors of cloth. This method of making fabrics enabled the carriage and automobile manufacturer to decide upon any color of cloth and feel assured that he could easily obtain a lace to harmonize with it. Upon this side of the water no such method of manufacture prevailed, and as a result the vehicle manufacturer was put to great disadvantage.

The French manufacturer, moreover, was the first to introduce the sample book system as it is known today.

At one time the impression prevailed that the superiority of the French manufacturer's products was due to the fact that Australian long fiber wool was principally employed in the making of cloth and lace fabrics, whereas in this country only the short fibered wool was used, and, as a matter of fact, continues to be used. However, experience has taught a different lesson and today both the long and the short fibered fleece are being used with equal success.

We now have in this country manufacturing plants devoted to cloth and lace making of much larger and more imposing proportions than any to be found abroad. The American car manufacturer and owner have cause for satisfaction in this condition of a great industry inasmuch as it provides a fine selection of fabrics to choose from at a cost less than what one might expect to pay for the same grade of goods with a foreign label attached.

At the approaching Madison Square Garden Automobile Show, as perhaps never before, the public will have an opportunity to judge of the variety and magnificence of upholstery fabrics as made up in a great display of cars of both medium and high-priced design. And it may be suggested that the prospective buyer go over the cloths and laces made up into beautiful works of art, and study at close hand, and for himself, what creations of luxury they afford.

Paint and finish and upholstering are both selling and buying factors, and they are at the present time figuring more largely in the sales department than ever before. Sales are known to rise and fall by these issues alone.

Among the novelties in finish applied to automobile body work for exhibition at the Madison Square Garden Show is **the cane or basket-work effect brought up under a very high state of finish.** This basket-work imitation comes in the form of paper with a muslin back, the cane or basket-work imitation being stamped out on this. The material is imported, coming in rolls 20 inches by 80 inches. The fabric is cut to fit the panels, these panels being painted in any desired shade or color. The material is pasted securely to the surface and over it is then placed the high finish.

At the coming New York shows novelties in lake pigments will be displayed to an extent hitherto quite unknown. An automobile body with two or three shades of lake graduated from light to dark constitutes a daring exhibition of color work, and when well done never fails to elicit admiration. For example, in the treatment of scarlet lake, starting at the top of the panel with the deepest shade, the color is then graduated in gently softened tones until the light shade is reached, with the result that when the blending is artistically executed the effect is something splendid to see.

All the lakes running along through from rose lake, crimson lake, carmine lake, Munich lake, English scarlet lake, and purple lake, to chatemuc lake, are susceptible to the magic of brush work to an extent perhaps greater than any other colors, and this doubtless explains their increasing popularity in automobile work. On the wide and flowing fields of the big cars these pigments of rare beauty and brilliancy are made to display their real magnificence and serve the pleasure of delighted car owners the world over.

Lakes Call for High-Class Process

Generally speaking, it doesn't pay to cheapen the process of developing the lake or transpartnet color finish. A purple or crimson lake that costs $6 a pound should be brought to the surface by a strictly high-class process, or not at all. To use expensive lake pigments over cheap, inadequate grounds, by cheap methods, is only an ill devised method of throing money away. For cheap, inexpensive methods stick to the solid colors.—From *The Carriage Monthly* for November.

Principal Types of Thermometers and Pyrometers Briefly Explained with Reference to Their Best Ranges of Temperature and Their Value in the Manufacture of Automobiles and Accessories—New Tendency in Meter Implements

THERMOMETERS and Optical Pyrometers—Rapid and accurate determination of temperatures plays such an important part in the manufacture of automobiles that the measuring instruments used for this purpose more and more crave the attention of manufacturers wherever quality of the output and economy in production are considered equally indispensable. In the quenching bath of water or oil the desirable temperatures range from 0 to 200 degrees C., according to circumstances. For the drying room, the color-baking ovens and for the temper colors the required heats range up to 400 degrees; in the annealing ovens from 300 to 690; at the forge and in gas or oil furnaces from about 600 to 1100 degrees C.; and for electric or oxy-acetylene welding much higher. In all cases the exact temperature is of greater or lesser importance for obtaining the best possible results. The steel industry, the electric furnace and the automobile are probably the factors in modern industrial life which are most directly responsible for the rapid progress which has been made of late years in developing practical measuring instruments from scientific laboratory apparatus. One of the most important of all the advance steps, however, has been evolved, in the form of optical pyrometers, by a scientific combination of the common blacksmith's method of judging heat by colors with the no less common practice of judging colors by matching them.

The development which has taken place has gone in several directions. Old-style thermometers have been perfected so as to give readings from minus 200 deg. C. to plus 750 degrees and to record the readings. Electric-resistance thermometers cover the range from minus 200 degrees to plus 900 degrees, while of especial industrial convenience from 300 to 600 degrees. Thermo-electric thermometers, which are frequently termed pyrometers, are especially useful from 700 to 1000 degrees. By combining the electric-resistance and the thermo-electric types, readings from minus 100 to plus 1,000 degrees may be reliably recorded. The optical or sight pyrometers are particularly adapted for measuring temperatures above 1,000 degrees and up to 7,000 degrees, although special constructions in this class of instruments cover a more limited range. It is by means of the optical pyrometer that the temperature of the sun, as seen through a clear atmosphere, has been recorded as about 6,000 degrees.

During all this progress the means for establishing and correcting a heat scale has nevertheless remained unchanged. The old gas thermometer, which is described in nearly every textbook on physics, is still the highest authority by reference to which the dials of all other instruments are verified. In its first form it was based on the expansion of air, but now hydrogen is the gas used for measuring temperatures from minus 200 degrees up to plus 1,000 degrees, and the receptacle which is exposed to heat or cold is of platinum. At higher temperatures hydrogen shows an inconvenient tendency to pass through a large number of substances, platinum included, and nitrogen is used instead. The bulb or receptacle for the gas which until lately was made of refractory procelain is now blown from molten quartz. Richard *Frères* and Wiborgh have turned out thermometers of this type intended for industrial uses, but they have not found wide application.

IMPROVEMENTS IN OLD TYPES

Glass thermometers depending upon the expansion of a liquid, such as mercury, alcohol, toluene, spirit of gasoline or pentane, have been limited to small ranges of temperature by the freezing and boiling points of the fluids and by the softening of glass under a relatively moderate heat. By replacing the air over a mercury column by nitrogen or carbonic gas and using Iena glass, in which borates are added to the silicates, the range can be raised to 550 degrees C., but there is still the need of guarding against sudden changes and mechanical shock. Siebert & Kühn, of Cassel, have lately made thermometers of quartz which can be used up to 700 deg. C. and, being provided with a scale traced on a strip of quartz, these instruments are reliable even with prolonged exposure to the heat and they are completely indifferent, mechanically, to sudden changes. But at 700 degrees the inert gas over the mercury column reaches a pressure of 60 atmospheres, and the mechanical fragility remains an undesirable feature.

More robust thermometers depending upon the expansion of a fluid are made by Richard *Frères*, Steinle & Hartung, C. J. Eckardt and others. The type is shown digrammatically in Fig. 1. The steel bulb *a* is connected by a capillary tube *b*, whose outside diameter is 5 millimeters and inside diameter 0.5 millimeter, to a hollow and flat spring *c* whose cross-section is shown at *d*. The air is driven out (presumably by mercury vapor), and the apparatus is filled with mercury through a small hole afterwards closed with solder. Now, when bulb *a* is heated, mercury is driven into the hollow spring *c* which is thereby extended, so as to assume a shape giving more room for the mercury, and its free end is made to move the hand *e* over the graduated scale *f*. These thermometers are used for locomotives, being in that case equipped with a compensating device which is practically a duplicate hollow spring in which the mercury is actuated from the same bulb and acts upon the same dial axis, thereby quieting the hand and obviating the disturbing effects of wind, speed and vibrations. Similar thermometers are provided with electric sound signals indicating desired maximum and minimum temperatures.

The recording of temperatures is usually accomplished by a stylus tracing a curve on a roll of paper which turns around once in 24 hours and may be set to turn at different speeds if desired. The Eckardt system for this purpose is indicated in Fig. 2. A flat disk may be used instead of a roll, and photographic methods of recording have also been employed.

To transmit the readings at a distance—the office of a technical manager, for example—electric connections are established operating a second indicator hand at the distant place of observation, either continuously or intermittently; or, if it is only desired that the temperature may be ascertained at any chosen time, a press-button system is arranged. These devices are

expensive, however, and are disappearing because the transmission of readings at a distance, wherever it is essential, justifies the installation of electric-resistance or thermo-electric thermometers by means of which it may be accomplished much more conveniently, since the electric or thermo-electric current is with them the direct means for measuring the heat variations.

INDISPENSABLE FOR ANNEALING WORK

The electric-resistance method is used especially in England, where it was first perfected through the research work of Callendar. Between the limits of minus 200 deg. C. and plus 700 deg. C. the thermometer of this type seems to be more sensitive than the Le Chatelier thermo-electric pyrometer, while the latter excels above 700 degrees. For temperatures between 300 and 600 degrees it is in practice an indispensable guide, as this range is not covered well by other types. It is based on the fact that the electric resistance of a metallic conductor grows about 4/1,000 for each degree of increased heat, in the case of pure metals. Once introduced in industrial form upon the European continent by William Siemens, several models of this type have been manufactured. The latest are those made by Hartmann & Braun, of Frankfurt, and by Heraeus, of Hanau. The active part is a platinum wire coiled upon a quartz core 3 to 4 millimeters in diameter and 60 millimeters long. The coil is inserted in the slightly larger bore of a very thin quartz tube. The air is then expelled while the external tube is softened in an oxy-hydric flame until the platinum wire becomes completely imbedded in quartz. By a somewhat elaborate method, too long to describe, the resistance of the platinum wire is made exactly 50 ohms at 0 deg. C., and this feature is alike for all thermometers of this kind. The element produced in this manner corresponds to the mercury bulb of an ordinary thermometer, and in continuation of it there is a quartz sheath containing the transmission wires which are of silver, gold or platinum. The whole of this is then enclosed in a steel tube for protection against mechanical and chemical actions. As electric source, either a storage battery or a light current with a suitable auto-converter may be used.

In order to measure the variable resistance, which gives the temperature, there is used a post comprising a Wheatstone bridge and an Arsonval galvanometer (as made by Siemens & Halske) with a graduated scale. The resistance of the three branches I, II and III of the bridge (Fig. 3) is equal to that of the thermometer at zero of the thermometric scale; at this temperature it passes no current. If the temperature varies, and thereby the resistance, the hand of the galvanometer is deflected. A simple reading gives at once the temperature. The essential condition for getting an exact measurement is that the resistance of the bridge remains constant. To control and, if need be,

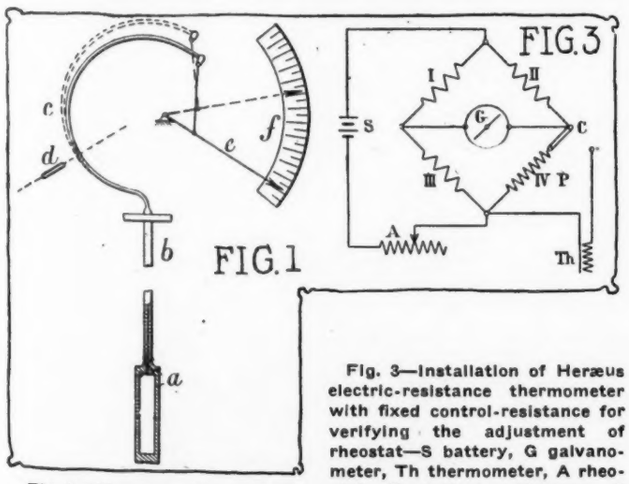

Fig. 1—Diagram of mercury thermometer made without use of glass

Fig. 3—Installation of Heræus electric-resistance thermometer with fixed control-resistance for verifying the adjustment of rheostat—S battery, G galvanometer, Th thermometer, A rheostat, P control resistance, C commutator, I, II, III, IV Wheatstone bridge

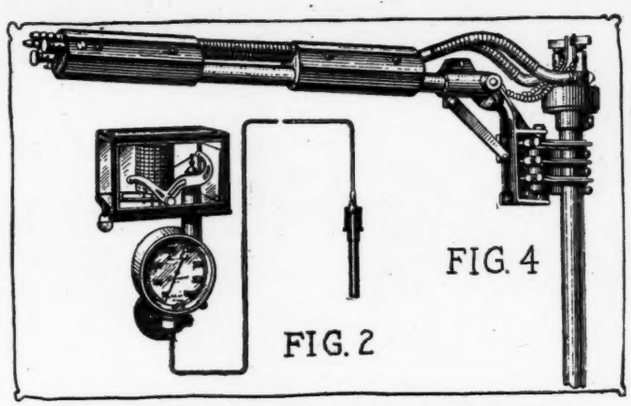

Fig. 2—Recording with steel bulb mercury thermometers
Fig. 4—Thermo-electric pyrometer with water-cooled terminals

regulate this factor, a variable resistance A is used which may be modified at will. By switching in the control resistance P by means of commutator C the hand should at a certain temperature take a certain position marked in red on the dial. If the hand covers this mark the apparatus is in order. Otherwise the variable resistance A is changed until this result is obtained.

The control may also be effected by switching in a voltmeter between the two conduits connecting the battery and the Wheatstone bridge, and afterwards the resistance A. By the control resistance P, which is equal to that of the thermometer at a certain temperature, the tension of the current is verified, as before, and it is corrected, if necessary, by varying A. A simple reading of the galvanometer then gives the temperature. This method is especially advisable where many thermometers are controlled and read by means of a single galvanometer.

WIDELY PREFERRED FOR HEAT TREATMENT OF STEEL

Becquerel first conceived the thermo-electric instrument, and the industrial form given it by Le Chatelier is widely known. Though its price is high—about $80 in France—the Heraeus firm alone has made and sold 2,000 of its kind. The thermo-electric element comprises a platinum wire, 1 1-2 meters long and 0.6 millimeter in diameter, fused by an oxy-hydric flame to another wire of the same dimensions but composed of 90 parts of platinum and 10 parts of rhodium. Insulation is provided by porcelain tubes, and the whole is placed inside of a steel tube, if the temperatures to be determined range below 1,000 deg. C.; otherwise in a sheath of quartz glass or fire clay.

The tension of the thermo-electric current which is produced when the element is placed in the fire is a function of the difference in temperature at and around the element and at the terminals of the apparatus. The current is transmitted to a galvanometer with two scales, one giving the electromotive force in millivolts and the other the temperature. The calibration is done by comparison with a gas thermometer. The means for registering the readings at a distance are well known and simple, consisting in mechanical provisions for causing an indicator point to travel over an inked or smoked paper roll or disk. By means of different-colored inks the readings from 6 pyrometers may be recorded on one roll.

For temperatures lower than 800 deg. C. and with a view to reducing the cost of the thermo-electric element, Keiser & Schmidt, of Berlin, and Hartmann & Braun, of Frankfurt, use iron and copper-nickel or silver and copper-nickel instead of platinum and platinum-rhodium, and the indications furnished by these instruments are sufficiently accurate for ordinary purposes, while their lower price permits the installation of more thermometers at any one plant.

It is a drawback to thermo-electric thermometers that they must be exposed somewhat long to the heat which is to be measured before reaching an equilibrium of temperature. The time can be shortened by baring the element to the heat, but

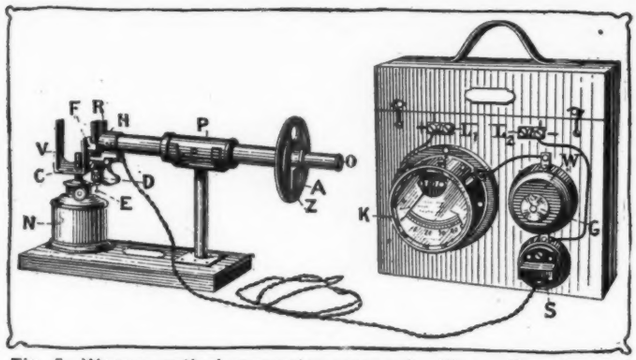

Fig. 5—Wanner optical pyrometer arranged with auxiliary lamp N for verifying or correcting its readings

when this is done the platinum easily becomes brittle. As the thermo-electric apparatus measure only the difference of temperature between the element and the terminals and are calibrated for a certain temperature of these terminals—usually 20 deg. C.—it is necessary for accuracy to keep the terminals cool by a water circulation, as in the Le Chatelier pyrometer shown in Fig. 4, or else to displace the graduate scale of the galvanometer by means of an adjustment screw to compensate for the discrepancy between 20 degrees and the actual temperature of the terminals. Some instrument makers who use an iron and copper-nickel element, notably Keiser & Schmidt, add a compensating device, which is practically a prolongation of the element and renders it unnecessary to make any correction of the terminal temperature. With this construction it is also practicable to use the instrument for the middle range of temperatures, such as, for example, for telling the heat of superheated steam.

INSTRUMENTS DEPENDING ON HEAT RADIATION OR LIGHT RAYS

Féry's pyrometric telescope was the first industrial application of Stefan's scientific experiments of 1880, subsequently confirmed by Boltzman and others. Féry's instrument is based on the law that: The amount of heat radiated by a black body (as defined by Kirchhoff) or from an opening in a furnace at high temperature is proportional to the fourth power of the absolute temperature of the black body or of the furnace.

The heat radiations from the heated piece act on an iron and copper-nickel element, and the current produced is measured by a galvanometer. The recording may be done as with a Le Chatelier instrument. The advantage of the pyrometric telescope, as of the optical pyrometers which are replacing it in industrial practice, is that it permits the determination of heat at a distance without necessity for exposing either the instrument or the observer to its ordinary effects.

Optical pyrometers are distinguished from the Féry instrument by being based on the measurement of light and not on that of radiated heat. They therefore serve for the measure of temperature only when this is so high that light is emitted. As visible light rays from metals begin at 500 deg. C., the optical pyrometer method becomes practicable only from 600 degrees up and preferably should not be used until 900 degrees is reached. The principle of all optical pyrometers is to match the light emitted from the object whose temperature is sought with another light whose temperature value is known. The best-known pyrometers of this type are the Le Chatelier pyrometric telescope, the Mesuri & Noel, the Holborn & Kurlbaum, the Moise and the Féry & Millochau. To calibrate these instruments it is necessary to know the law of relations between the intensity of light emitted by the heated material and its temperature. These laws have been studied by Paschen, Wanner, Lummer and Pringsheim and have been mathematically established by Wien and Planck. It is on the basis of the work of these men that Mr. Wanner has constructed an optical pyrometer—manufactured by B. Hase at Hannover—which certainly at the present moment is the one most extensively used in Germany and which now begins to be employed in France also.

The Wanner pyrometer is a telescope of about 0.30 meter in length which in its interior contains a spectroscope combined with a photometer. By means of two slits situated in a vertical plane, within the telescope, two bundles of light rays are directed. One comes from the incandescent body whose temperature is to be determined; the other from a little incandescent lamp which serves as a means for comparison. The rays first pass through a prism where they are decomposed by refraction, then through a Nicol polarizer of Iceland spar and, before reaching the ocular, through a Nicol analyzer.

The instrument is so constructed that the observer receives only the red light corresponding to a wave length of 656 millimeters (the red line C in the spectrum of hydrogene). What he sees is two red spots of different light value. The lower one corresponds to the temperature to be measured and the upper one to that of the electric control lamp. The Nicol analyzer is now turned until the two spots are equally luminous. A wheel, Z in Fig. 5, with a graduated scale A measures the angle which the analyzer must be turned in order to produce this result, and Messrs. Wien and Planck have established the law by which the temperature is obtained as a function of the sine of this angle. It is important that the light source is of constant intensity, and as the source actually is a storage battery it is necessary to determine the resistance to be placed between it and the electric bulb—whose location is inferiorly at H in Fig. 5. This is done by means of a lamp burning acetate of amylic alcohol giving a fixed intensity of light to which the electric bulb light is made to correspond. Fig. 5 shows the apparatus as arranged for making this control. L_1, L_2 are the terminals of the battery, W the resistance rheostat adjustable by the button G. K is the galvanometer indicating the constancy of the light current, S the contacts, P the pyrometric telescope, N the control lamp in position for comparing the two lights, VFR the visor for placing this lamp correctly, EDC the contacts for the electric lamp, O the ocular. When all the precautions are taken, the results from this pyrometer are satisfactory, but its price is high, running from $150 to $200 in Germany. Though apparatus of this order date back only to 1902 nearly a thousand of these instruments have been sold, mostly to steel producers. They are made in several models, for heats ranging from 840 deg. C. to respectively 2,000, 4,000 and 7,000 degrees, and in some of the models the temperature may be read directly from a scale while with others one or more tabulations must be consulted. Recently a model has been made which measures heats as low as 600 degrees, and in this all the luminous rays—not only the red ones—can be gathered into the luminous spots which are compared.—From article by Eugène Grandmougin, Professor of Chemistry at Mulhouse, in *Le Génie Civil*, September 7 and 14. [Popular "pyroscopes" have also appeared in the German market in which the heat colors of steel are reproduced by a kerosene flame and differently colored films. These are turned into view until the heat color of the work is matched, and a scale then shows the temperature.—Ed.]

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MOTOR Implements—It is noticed from accounts of public tests of motor-powered agricultural machinery recently held in France that the blades and wire tools used for cutting and loosening the soil in the machines made by the *Motoculture Française* company are not now so thin and resilient as first planned by Mr. de Meyenburg, who is identified with this company and was the first to conceive and realize the need for elastic soil cutters and the abandonment of the traditional ploughshare. In the new machines the cutting tools have some resiliency, but most of their ability to avoid breakage and violent shocks to the whole mechanism of the machine, when stones or other obstructions in the soil are encountered, is obtained by mounting them on springs which permit the cutting tool in its entirety to be deflected from the obstruction.—From illustrations in foreign exchanges.

Two Closed Bodies for Overland 59-R

Coupé Design and Special Collapsible Top Adapted for Runabout Chassis

By George G. Mercer

A SUITABLE car to which a closed body can be adapted is the Overland 1912 model 59-R. Two designs are presented here for this purpose, one a new body of coupé form and the other a combination body or roustabout.

Of the two alternatives the coupé body would cost approximately $800, no alteration being necessary on the chassis, while the second design, which is really an addition to the body, and one, moreover, that easily permits of a return to the original runabout form, requires an outlay of only $300.

The stock Overland 59-R runabout is shown in Fig. 4 and the general appearance of the coupé and roustabout adaptations is given in Figs. 5 and 7.

The coupé body is a light-weight design suitable for the small chassis of this car, the wheelbase of which is 106 inches, the tires being 32 by 3.5 inches; the springs, 1.75 inches, and the four-cylinder motor 4 by 4.5 inches. It is installed in exactly the same space lengthwise as that occupied by its predecessor and the increase in weight over the runabout body will not exceed 400 pounds.

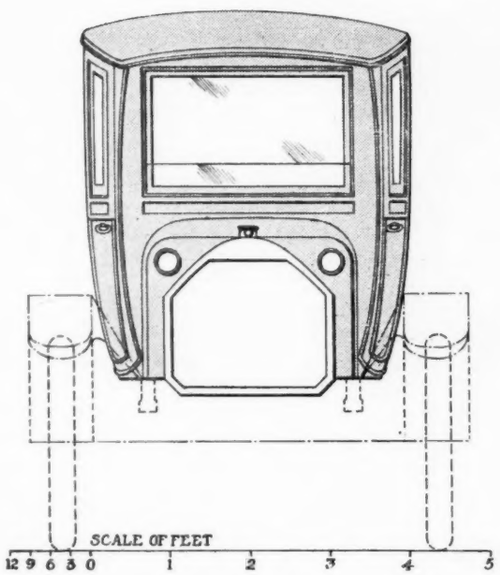


Fig. 1—Front view of Overland coupé design

No new parts, such as mud guards, etc., are required, with the single exception of the dash lamps, and these are included in the body specifications. The rear tire carriers remain on the tool box as with the runabout design.

Though the suggested body is small in its plan dimensions, the height over the cushion to the roof is of standard measurement, and the size of the cushion being the same as that of the runabout there is ample accommodation for two people. The size of the door opening and length and width of the body are given in Figs. 2, 3 and 5. As overloading the chassis is a point of some importance in small cars of the type in question, the construction work is of light design, the greatest saving of weight being effected by forming the upper rear quarter and the back panel of cloth instead of the usual wood or metal paneling.

The cloth used is heavy enameled duck, finished with a surface that imitates the grain of leather. This material is capable of withstanding hard wear and when used in the manner shown is impervious to water. A single piece is used, extending from the hinge pillar on one side to the corresponding pillar on the opposite side. It is fastened under small metal mouldings at the front and along the bottom edge, and at the top it is fastened under the wood drip moulding. The framing inside to support the roof and to form the openings for the windows is of very light construction. An oval window is inserted in each side and two smaller windows of circular form at the rear. All are finished with metal mouldings that serve to fasten the cloth and also to form a flange to hold the glass.

Although the sides of the body are made of flexible material, the roof does not fold down, but is a permanent structure of .25-inch pine sheathing. Over this is stretched the same material as that used for the panels, but of lighter weight, and the edges are nailed under the drip moulding also.

Ordinary practice is followed throughout the remainder of the body construction. The lower panels and the cowl are

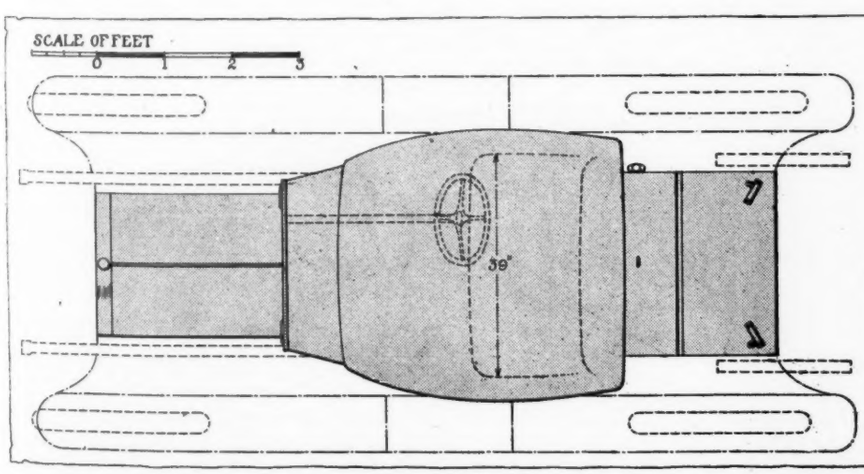


Fig. 2—Plan of suggested Overland coupé

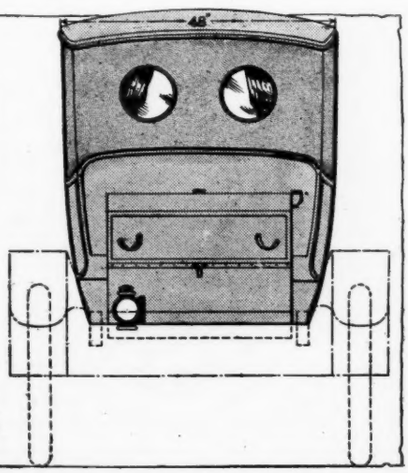


Fig. 3—Rear view of Overland coupé

.0625-inch aluminum, with aluminum mouldings; the door handles and locks are of the regular pattern, and outside butt hinges are used on the doors to save weight in the framing.

Mahogany frames are used for the door windows and these are made to drop their full length. The frames of the front windshield are of the same wood and the cut in the shield for the visor is shown in Figs. 1 and 5. The oval side panes and the circular rear lights are stationary, and all glass used is plain crystal plate.

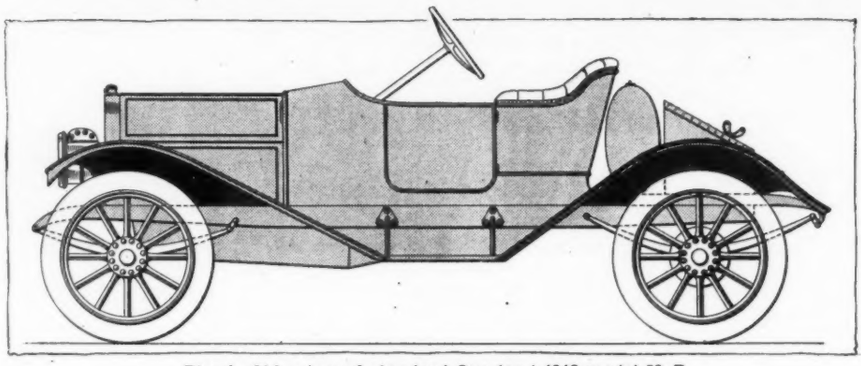


Fig. 4—Side view of standard Overland 1912 model 59-R

Suitable colors for painting the body would be the standard blue used on Overland cars for the cowl and body panels below the belt line, with black mouldings. This will agree with the chassis color. Above the belt line all framing and mouldings could be black to correspond with the black enameled cloth used for the side and back panels and the roof. The name panel on the doors to be blue and the metal mouldings around the quarter and rear lights for fastening the cloth on the edges to be black, also the door hinges.

The finish on the door handles, supports for the front windshield, exposed rim of the dash lamp and both the tail and headlights to be either silver or nickel.

For the trimming a suggestion that would harmonize well with the design would be blue broadcloth of a lighter shade than the body color, with lace of the same ground color and having a fleck of red woven into the pattern. The light touch of red will give warmth to the interior appearance and this can be further advanced by having the carpet similarly marked. The trimming of the body will be the same as if the exterior panels were of metal or wood. The blue silk curtains on the doors run on spring rollers, while those on the quarter and rear windows are draped.

Suitable appointments for the interior would be one card case and one ash tray with blue morocco finish fastened to the doors; an electric roof dome light, and possibly some form of corded hat rack. These and a few pockets suitably distributed will be all that are required.

The dash lamps are let into the dash with only the rim and the glass visible. The horn is located on the right side and is preferably of the electric type. The steering wheel is located on the right side and the change gear and brake levers in the center of the car, allowing easy access from either side. This construction also makes possible the use of a narrower body than usual. Cloth panel material will lessen considerably the cost of the article, and the body as designed, finished according to the description given above and mounted on the chassis will represent an outlay of approximately $800.

This design is very compact and for the purpose for which it is intended it will be found well adapted to meet all requirements.

To turn now to the roustabout design, Fig. 7 shows the same standard body as illustrated in Fig. 4, but with the addition of a closed-in top of waterproof cloth on rather novel lines. This top is provided with two large glass windows on each side, one on each door and another in each quarter back of the door. It is light and flexible and affords ample protection when raised with the glass frames in position. When lowered, as indicated in Fig. 6, it affords all the advantages of an open car. The windshield is stationary and is of the V-type, that is, it consists of two planes receding at a slight angle from a center pillar on the cowl. By this construction the wind-resisting surface is lessened, as the slanting sides deflect the air pressure instead of fronting it as is the case with the ordinary flat windshield. This form of construction also has the merit of imparting considerable strength and rigidity to the forward structure.

The top as a whole is quickly and easily manufactured and is designed so that it can be removed in the spring and the body

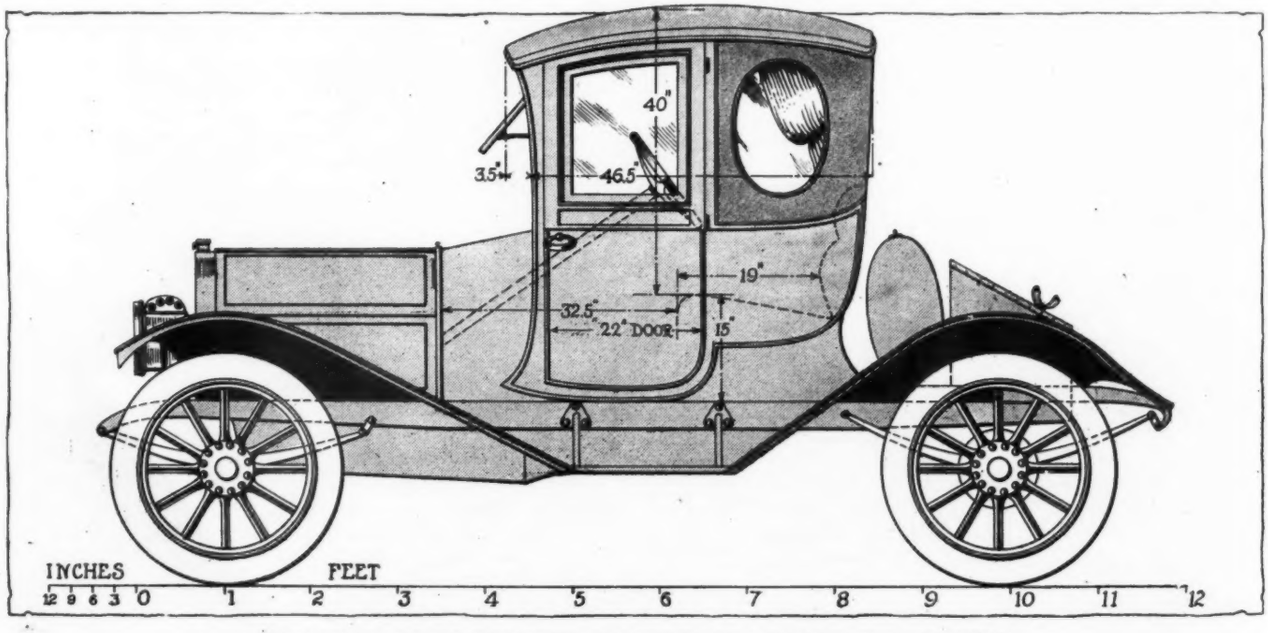


Fig. 5—Side view to scale of suggested coupé design for 1912 Overland model 59-R

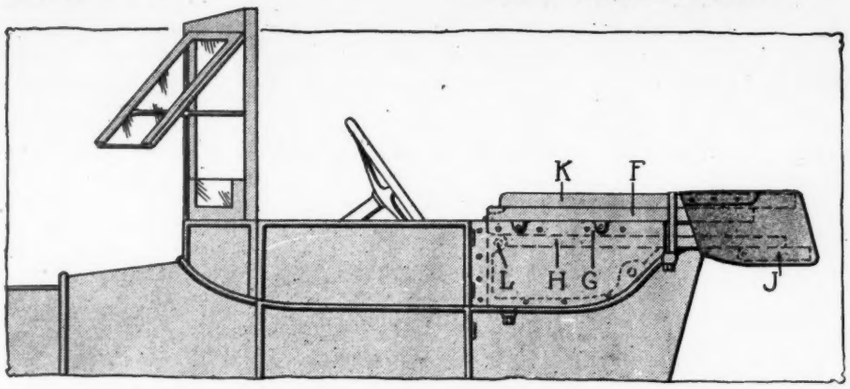


Fig. 6—View of roustabout design for Overland showing top down

returned to its original condition as an open car, as shown in Fig. 4.

Taking up the construction from the front, the windshield is made with solid panel and framing below line C, Fig. 7. The post A is connected by framing at the top to B at each side of the body and the glass is cut at D to form the visor.

The frames of the glass are of mahogany and the panel below C is formed of aluminum panel and molding.

Practically the only necessary alteration is that of a new door, which, as shown in Fig. 7, is made considerably higher than the original design.

The molding that bordered the top of the old door is shown across panel. One new door hinge is added above this molding line and the new lock is also placed above it. Conditions are allowed to remain as in the original car as much as possible to facilitate replacing the old parts, thereby permitting of the change being made without any great expense.

The door window frames are made to swing on hinges on line C and to turn down and lie flat against the inside of the door. Dotted lines E, Fig. 7, indicate the glass frame when in this position. These glass frames are of mahogany and the lower part of the frame is made extra thick to give a stable bearing when the frame is in the upright position. Spring catches, one at each side, are the means used to hold the frame erect. The posts B and F have metal flanges .0625-inch thick projecting 5 inches into the doorway, against which the door glass frame abuts when the door is closed. These flanges also form a wind break around the glass.

For the quarter glass frames, the same provisions are made with flanges on the posts at the back and front of the frame. These frames are made to lift out when the top is lowered and can be stowed under the seat. When assembling in position with the top raised, these frames are put in from the outside, the top of the frame fitting into a pocket on each pillar. Two machine screws made specially for the purpose are then passed through lugs at the bottom, attached to the glass frame and made fast in plates inserted in the framing G, thereby securely locking the frame in position. To keep the frames from rattling and shaking loose and to insure against leakage of rain at points around the joints, all the edges of the door and quarter frames ar bound with rubber channel.

The large quarter glass used in connection with a collapsible top of the type illustrated is one of the distinctive features of this design and requires special construction to provide for same. The framing around the window is formed by the post or bow F at the front, the post or bow H at the rear and the horizontal framing G at the bottom. At the top between the bows F and H no framing is required, but a joint I is used to keep the bows properly separated. The joint I is also connected with the short bow J by a separate arm which is used to throw the bow into proper position when the top is folded down.

The other member to complete the folding top is the bow K. This horizontal bow engages in the bow F, as illustrated in Fig. 7, and when folded down it also engages with the same bow, and at the point where the latter breaks, as illustrated in Fig. 6.

A good quality of heavy-weight mohair or burbank of a dark color will be the most suitable material for the top cover and curtains. The top cover is fastened to the bows in such a manner as will allow folding properly. The curtains are made in five pieces; the back curtain and the quarter stays detach at the bottom and roll up, and the small curtain below the framing piece G is loosened when the top is folded and then replaced when the top is down.

A great deal of comfortable service can be obtained from a car thus equipped and the cost of changing the car from Fig. 4 to Fig. 7 will approximate an outlay of $300.

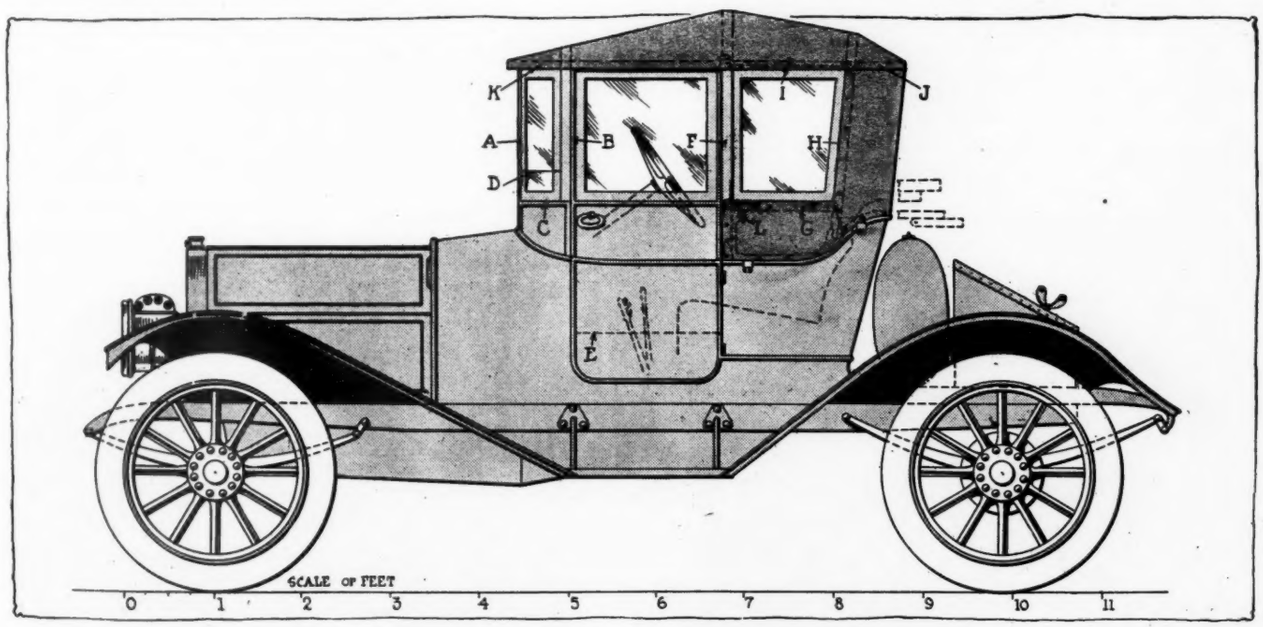


Fig. 7—Suggested collapsible hood design for Overland 1912 model 59-R

Among the New Books

Works Which Have Recently Appeared That Should Appeal to Automobilists as Well as to Those in the Industry

LABORATORY MANUAL FOR TESTING MATERIALS OF CONSTRUCTION, by L. A. Waterbury, C. E., Professor of Civil Engineering, University of Arizona, Member of the American Society for Testing Materials. Published by John Wiley & Sons, New York City. 270 pages, 5 by 7 inches, with sixty-eight illustrations. Cloth, $1.50.

While primarily intended as a manual for a school laboratory, this work is also of interest to the practical engineer wishing to brush up on certain details of material testing. The work is divided into nine chapters. The first chapter contains such information regarding the use of the different testing machines and methods of marking and conducting the tests as well as detailed instructions as to how to prepare a report. The various tools, instruments and measuring devices are taken up in the next chapter, while each of the remaining chapters deals with a specific material, including cement, concrete, iron and steel, wood, brick, sand, gravel, stone, asphalt, etc. In the appendix are several papers on subjects relating to the testing of materials.

MOTOR BODIES AND CHASSIS. By H. J. Butler, Technical Editor of *The Automobile and Carriage Builders' Journal;* Foreword by the Rt. Hon. The Lord Montagu, of Beaulieu, Editor of *The Car Illustrated.* Published by the D. Van Nostrand Company, New York City. 328 5 1-4 by 8 1-2-inch pages with numerous explanatory illustrations. Cloth, $2.50.

Up-to-date we have few complete books of this length which put into intelligible form the details of construction of the whole car from upholstery to spark-plugs. This book tells how the automobile is built. It gives specific information on every point and does not deal with the mere surface of the subject but goes to the heart of the matter. As a work which not only describes the different parts of a car but tells how each is built and gives the measurements required, it is unique. At every point it bears the mark of completeness and attention to detail.

THE MODERN GASOLINE AUTOMOBILE, ITS DESIGN, CONSTRUCTION, OPERATION AND REPAIR, by Victor W. Page, M. E., Consulting Engineer, formerly technical editor *Automobile Journal.* Published by the Norman W. Henley Publishing Company, New York City. 700 pages, 6 by 9 inches, with 500 original illustrations and ten folding plates. Cloth, $2.50.

There have been two distinct periods in American literature on the automobile. This mode of conveyance, which has probably created more interest than any other topic during the past 10 years, was the subject of many detailed writings when it first began to make itself known as a prominent factor in the world's progress. After that time there came a pause and we are now in the second period. All of this will explain why this work is modern and free from the elementary ties that bound the early authors. The book is a complete study of the automobile from fuel to upholstery. The trend in modern practice is outlined in the early chapters and step by step every portion of the motor, chassis and body are taken up and discussed. The illustrations are new and original. The Knight sliding sleeve valve and several of the later developments in rotary valves are explained. Of special value is the chapter on upkeep of the car.

MODERN MACHINE SHOP CONSTRUCTION, EQUIPMENT AND MANAGEMENT, by Oscar E. Perrigo, M. E., Member of the American Society of Mechanical Engineers. Published by the Norman W. Henley Publishing Company, New York City. 343 pages, 7 by 10 inches, with more than 200 illustrations. Cloth, $5.

In view of the interest which is just at present felt in factory efficiency a work of this kind should attract universal attention. The laying out of a plant has so much to do with the quality of the work that is turned out as well as with the cost of turning it out that too much cannot be said on the subject. In the first part of the book the author goes into details regarding the construction of the plant. He points out the various methods in use for different parts of the factory and gives elaborate directions regarding the use of specific materials for salient points in the construction work. The illustrations in this part of the work show how the actual building of some of the most modern factories is carried out, telling how certain puzzling problems have been met and solved. In the second part of the work the equipment and its arrangement have been touched upon, as has also the proper space to be allotted to each department and where they should be placed. The third part of the work takes up the actual system of management and paying of the men, the well-being of the employees and the authority to be vested in each of the foremen. The question of the superintendent's office and its work is given special attention.

GAS AND OIL ENGINES, by Alfred Kirschke, translated from the German and adapted to English practice by Charles Salter. Published by Scott, Greenwood and Son. Sold in the United States through D. Van Nostrand Company, New York. 158 pages, 4 1-4 by 7 1-2 inches, with 55 illustrations. Cloth $1.25.

This is a description of the principles of the more important developments in the gas engine field since 1860. It is a work more for the man interested in the larger gas engines than for one who is chiefly concerned with the smaller types. An especially good chapter on the Diesel motor and the principles of its operation lends considerable value to the work. The author, who is chiefly known through his efforts as lecturer at the State and Municipal School of Handicrafts, Halle, England, has touched upon the salient features of the best recognized types of motor and has contrasted these and compared them with a view of presenting a broad view of the entire situation.

PRIMER OF SCIENTIFIC MANAGEMENT. By Frank B. Gilbreth, member American Society of Mechanical Engineers. Introduction by Louis D. Brandeis. Published by D. Van Nostrand Company, New York City. 103 5 by 8-inch pages. Cloth, $1.00.

What is Scientific Management as an art? What is the Taylor system? How can I introduce the principles of cost saving into my business without destroying it? All these questions and many others are answered in this book which does not pretend to be a complete discourse on Scientific Management, but merely as the title states—a primer.

TOUR BOOK OF THE CALIFORNIA STATE AUTOMOBILE ASSOCIATION.. Published by the association. 630 pages, with maps. Cloth, $2.50. Paper, $1.50.

Several hundred tours throughout the States on the West coast are mapped and outlined and the work contains all the valuable information that a book having routed tours generally has for the automobilist. Some unique and good features are incorporated in the way the book is laid out among them may be mentioned the large type used in numbering the pages and the complete index.

THE DRAFTING OF CAMS, by Louis Rouillion. Published by the Norman W. Henley Publishing Company, New York City. Twenty-four pages, pamphlet form, with sixteen explanatory figures. Price, 25 cents.

One of a series of practical papers issued by the same concern. This deals with the laying out of cams for al purposes and gives drafting-room directions on the method of drawing each.

PRIMARY BATTERY IGNITION, by C. Wadsworth, Jr. Published by the D. Van Nostrand Company. Seventy-seven pages, with twenty-eight illustrations. Boards, $1.50.

A little work on battery ignition that serves a worthy purpose in that it explains some of the simpler instruments and at the same time gives an insight into the workings of a battery ignition system. The high-tension coil is taken up in detail and practical information is given as to its adjustment. It is printed clearly on good paper and is written in such a way that no one should have difficulty in following the author.

Recording Work of Automobile Salesmen

New York Selling Organizations Use a Number of Blanks for Keeping Track of Salesmen's Arrangements

Elimination of Chance Work, the One-Man Idea and of Inefficiency Are the Aims of This System

SALESMEN, like other mortals, must do their work in a systematic way to accomplish things. The advantage of system, as in other fields of endeavor, is increased capability of the salesman to help himself and the firm, and the abolition, at least to a certain extent, of the one-man principle which is considered a detriment to modern business. Control of their activities may not look an attractive thing to the vanity of some salesmen, but the good ones among them generally recognize their own advantage in a progressive policy. Since a general staff officer in the army submits to a discipline and system, there is no reason why a salesman should not.

The A. Elliott Ranney Company, New York City, representatives of the Hudson Company, takes the sensible view that whatever means go to increase the efficiency of the salesroom and men are desirable, has developed a system on the ground of this principle. The fundamental scheme is the inducement of the salesmen to do as much work as is in their power and to give each man the credit which is due to him. This system has been the reason, to a considerable degree, that the company just mentioned has developed a splendid business during the past few years.

The system by means of which the salesmen's work is recorded includes a number of forms. On these forms daily, and in some cases weekly, records are entered, by which the salesmen inform the company of the calls made by them and the sales which they have closed; whereas in the communications from the firm to the sales staff the latter is informed of the standing of each man. Following are the forms used in the Hudson salesmen system of the Metropolitan branch:

1. Daily report of each individual salesman, giving the total of the work done by the writer and the various items constituting it.
2. Master card, giving the name of every prospect owner, which is made out and filed on the day when the first call is made.
3. Sales record made out by the salesman as soon as a transaction is closed.
4. Weekly sales statement given out by the firm to the salesmen.
5. A more detailed weekly statement which is kept in the office, giving the amounts paid to the company during the week, and during the selling season, being, thus, a sales statement.

Another form which is not in use by the Hudson branch in New York, but which should prove very useful if introduced, would be—

6. Layout of salesman's work for the next day, giving the appointments made, the arrangements made with the demonstrator, etc.; in short, all that is arranged beforehand and cannot be ignored without the possibility of complications arising therefrom.

Fig. 1 shows the daily salesman's report, which is made out on a white blank, 14 inches wide and 7 inches deep, lined and printed in black. The blanks are kept in pads, and every salesman upon returning to the store at the close of the day fills out one blank, in the manner indicated in Fig. 1. He enters his name and the date on the form, and then reports every call he made. This is done with considerable detail, as shown by the three cases appearing in Fig. 1. Besides name and address of every party called upon, the circumstances worthy of being recorded are noted. Furthermore, in the case of each prospect owner it is stated whether he has owned Hudson cars before or not.

Upon the basis of the information afforded by the daily salesmen's reports the master cards are filled out, one being shown in Fig. 2. This form is 8 inches wide and 5 inches deep, and lined red and blue, with black printing. Spaces are provided for name and address of the prospect owner, under whose name the card is filed. All master cards are numbered in rotation as they are filled out. The name of the salesman and the dates of his first visit and of his demonstration also find their place at the head of the form. All the space below the heavy black line is given to details which appear on the daily report cards of John Brown, and the card is large enough to permit of entering details of a dozen calls, using both sides of the form.

The sales record, Fig. 3, is made out by a salesman when he closes a transaction. This form mentions whether the purchaser is a former Hudson owner or not, as the company keeps exact records of the nature of its business. Of course, a salesman keeps a record of the sale in his own notebook, but this is outside of the scope of the company's system.

One of the purposes of this system is to breed confidence in the firm, and when a salesman has been assigned a prospect and has properly followed him up he is entitled to the percentage on the sale, even if the transaction should be closed on the floor while he is not in the store. By this condition salesmen are induced to spend only a minimum of their time on the floor; that is, when they take their turn in salesroom service. They in turn spend a day in the salesroom to take care of the parties who come in from the street.

At the end of every week a statement, Fig. 4, is made out by the firm and a copy is given to every salesman or agent mentioned on the form. This gives the salesmen a chance of comparing their achievements, and calls their attention to an error, if such should occur in the crediting of sales to the men. The weekly sales report covering the work of the salesmen for the week and season until the end of the week is typewritten for the office records of the firm, being made out as follows:

DATE Oct 16
SALESMAN John Brown

SALESMAN'S DAILY REPORT

REPORT RECEIVED H M Kenna

OLD	NEW	NAME	ADDRESS	REPORT
	X	F. M. Morrow	72 Bway	Saw prosp - second time Favorable Will probably decide this week.
X	X	D. H. Hunt	208 W. 79th St	Former Hudson owner. First call. Looks good Will probably take a 48
	X	R. S. Mason	2472 Bway	Ford owner. Fourth call Sale made.

Fig. 1—Daily report made out by the salesman of the A. Elliott Ranney Company, New York Hudson dealers

No. 713

NAME K. L. Mason

Salesman John Brown

ADDRESS 2472 Broadway, New York City

Source

Date Oct. 3-1912

Catalogue Model 37 Touring

Dem. Oct. 8-1912 Perkins

SALES LETTER RECORD

Oct. 3—Address by Mr. George M. Bell, 145 East 55th street. First call on prospect. Seems doubtful. Owns Ford, is in favor of buying another one this year. Will, however, have 37 demonstrated to him next week.

Oct. 8—Saw prospect at 2:30 p.m. Showed car, gave demonstration; 10 miles on Long Island. Liked car, but will wait for some other demonstrations and decide in a week.

Oct. 13—Called again, third time. Promised to decide on the 16th.

Oct. 16—Fourth call. Sale made. Full equipment. To be delivered, if possible, on Nov. 7.

Fig. 2—Master card of Hudson sales company, which is made out for every prospect owner

WEEKLY SALES REPORT OF A. ELLIOTT RANNEY COMPANY, NEW YORK, ITS BRANCHES AND AGENTS, FOR THE WEEK ENDING SATURDAY, OCTOBER 26, 1912.

Name of Salesman	Models A	Models B	Weekly Amount	Gross* Amount	Canceled	Net Sale
Brown	1	1	$9,000	$27,875	.....	$27,875
Allen	0	1	4,000	25,650	.....	25,650
Smith	1	1	9,500	23,425	$10,000	13,425
Jones	2	1	14,000	18,995	4,000	14,995
	4	4	$36,500	$95,945	$14,000	$81,945

*Sold during the model season so far.

Name of Agent						
Buckeye Auto Co.	1	1	$9,000	$12,550	.....	$12,550
Common Sense Auto Co.	0	1	3,500	11,000	$2,500	8,500
	1	2	$12,500	$23,550	$2,500	$21,050

Less 5.5 per cent. to dealers	$1,157.50
Net total amount of business at the end of the fifteenth week of the season	$19,892.25
Total of salesmen's sales	81,945.00
Grand total	$101,837.25

Model A

Sales previously reported,	6	This week, 5	Gross, 11
Cancels previously reported,	1	This week, 2	Gross, 3
			Net total, 8

Model B

Sales previously reported,	36	This week, 6	Gross, 42
Cancels previously reported,	3	This week, 1	Gross, 4
			Net Total, 38

Total number of cars sold up to date..... 46

Please credit me with following sale for week ending Oct 19 1912

Type 37 Touring Extra Body

Purchaser K. L. Mason. 2472 Broadway city

Amount $1910.

Previously owned Ford

If conditional sale give details

Date, Oct 16 1912 Salesman, John Brown.

L.B. N.Y. Y 10994

Fig. 3—Sales record used by Ranney Company's salesmen

SUMMARY OF CARS

	Gross A	Net A	Gross B	Net B	Old Owners	New	Other	Total
Brown	2	2	14	14	8	5	3	16
Allen	1	1	8	8	4	5	0	9
Smith	1	0	6	5	2	1	2	5
Jones	3	3	2	2	3	0	2	5
Buckeye Auto Co.	1	1	8	6	3	3	1	7
Common Sense Auto Co.	3	1	4	3	1	3	0	4
Totals	11	8	42	38	21	17	8	46

Percentage of Sales

Old owners	46 per cent.
New owners	37 per cent.
Other makes	17 per cent.
Total	100 per cent.

Comparative Weekly Statement of Sales Made During the 1912 and 1913 Seasons

	1912 Season	1913 Season
Number of cars sold by salesmen during 15 weeks	29	35
Number of cars sold by agents during 15 weeks	17	11
	46	46

This statement shows not only the number of cars sold by the various selling individuals and companies, but also the influx of cash during the week and the selling season so far progressed. It also shows the proportion of old Hudson owners among the buyers of new cars, thereby giving the company, and through it the factory, a chance of feeling the public pulse. This is one of the great points of this system. The weekly office record affords also a comparison of the business done during the present season with that of the previous one.

A system which is similar to that of the Ranney company in many ways and which has also been worked out with great care, is that of the New York branch of the American Locomotive Company. The forms used by this company are shown in the cut appearing on page 1057. Besides a sales blank is used.

The daily report and the master card are very similar to those used by the Hudson representatives, except for the provision of additional detail on the master card. The latter is 8 by 5 inches, and the daily report 11 by 8.25 inches, with blue lines and black letter printing. The daily out report is a sheet somewhat larger than the salesman's daily report and which is always kept on a desk in the salesroom. On this sheet each salesman, as he goes out, enters the time of his leaving and when he expects to return, as well as the parties whom he goes to see, in their proper order.

In this connection the system by means of which track is kept of the salesmen's appointments, as they come into effect, is worthy of mention. The salesmen when making appointments

enter them on their daily report sheets, and when the stenographer at the office goes over these sheets and transfers their contents to the master cards, she also fills out appointment cards, Fig. 9, which are filed in order of the critical dates. As the dates of these engagements come up, the girl makes out a yellow slip for each appointment, and hands it to the salesman on the morning of the right day. In this way, part of the salesman's work for a day is outlined for him when getting to the salesroom in the morning. As to new prospects, these are assigned to him by the sales manager, who first receives all inquiries which come in. The manager distributes the work fairly equally among the salesmen, except where cases call for special skill with particular classes of prospects. Certain salesmen are used to follow up interested brokers, and others interested private prospects, and so forth. Likewise, different men cope with the pleasure car and truck situation, respectively. To assign a new prospect to a salesman, the manager fills out the card, Fig. 8, held by a perforation to Fig. 10. The former is filed in the office and the latter given to the salesman.

In the Alco Company's store a salesman must follow up a prospect to such an extent that a resulting order gives him a moral right to the commission on the deal. If a salesman calls upon a prospect only once or twice and the latter drops in after a month to buy a car, this is hardly considered the result of the man's work. If, on the other hand, a salesman calls on a prospect half a dozen times, and a car is finally sold to him in the store, while the salesman is not there, he is credited, in the case of either organization, with the sale. The Alco Company has a rule that when two men work on one prospect, credit goes to the salesman who did five-eighths of the work of getting him. To give an idea of this work, the average time necessary to bring about a sale in the Alco line is from ten to twelve calls for a pleasure car of the $6,000 type, and about twenty times for a truck.

Sales for Week ending....October 26th, 1912

Salesman	Model 56	37	Total
Brown	1	1	16
Allen	0	1	9
Smith	1	1	5
Jones	2	1	5
Buckeye Auto. Co.	1	1	7
Common Sense Auto Co	0	1	4
	5	6	46 to date

Fig. 4—Weekly sales statement given to Hudson salesmen

One form which is suggested above under (6), is not used by either the Hudson or Alco companies. This is a layout, made by the salesman, which covers the work he expects to do during the day. This form would take the combined place of the appointment and daily out blanks, and be kept on the salesman's desk. It would be even more exact and true to the situation than the layout formed by the duplicates of the appointment slips, Fig. 9. Another point on which improvement is possible, is the matter of regular communication between salesman and office. The salesman who makes it a point to call up headquarters at regular hours, say at 10.30 and 3 o'clock, will save himself time in many cases, and will be sure that no important matter relating to his trade is delayed in the office or salesroom.

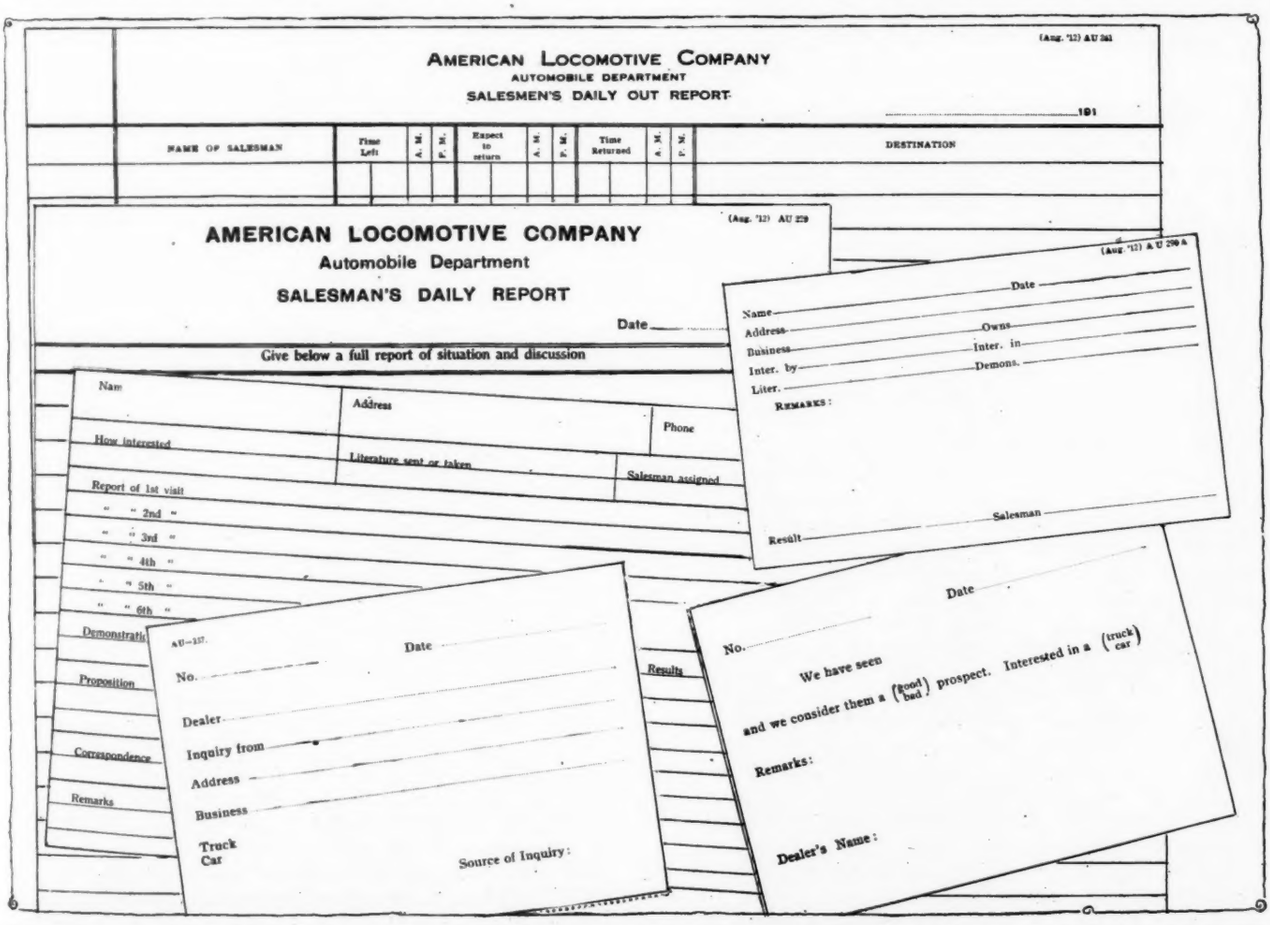
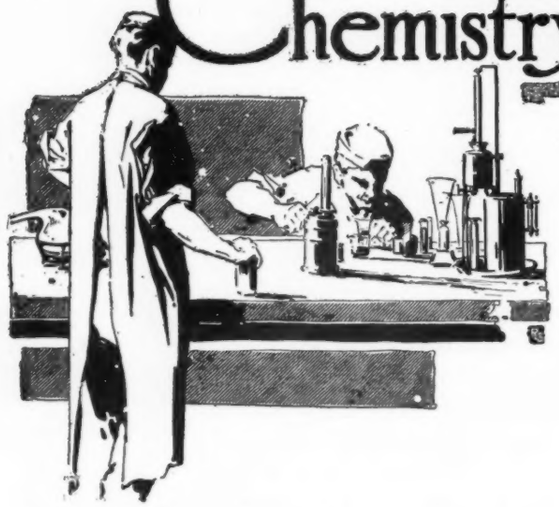


Fig. 5—Alco company's daily out report. Fig. 6—Salesman's daily report. Fig. 7—Alco master card. Figs. 8 and 10—Assignment card. Fig. 9—Appointment card

The Chemistry of Cylinder Oils



Considerable Variation in Gravity and Viscosity Found to Exist in Same Grade of Different Brands

Part IV

Being the fourth of a series of articles on cylinder oils which will appear from week to week. Discussions are invited and the columns of THE AUTOMOBILE *are open to pertinent criticisms.*

By W. Jones

IN Table B we give the analyses of forty samples of oil, all of which were obtained in New York City. The different brands are represented by letters, and the different grades of each brand are shown by numbers. These letters and numbers will be carried through all analyses to represent the brand and grade.

This table of analyses is given to show what the various brands of oils are, at the present time in the city of New York, and for comparison with the same brands to be obtained in other cities. While this is the primary object of these analyses, the table may also be of much use in comparing the different brands, one with the other, being, of course, careful to always compare the same grades, in the different brands. These different grades are, as above stated, marked by figures and are so arranged that the same figure in each brand shows the same grade, and where there is only one grade it has been marked so as to correspond to a similar grade in the other brands.

We have in brand A eight different grades, No. 1-a and No. 2-a, are water-white oils. No. 1-a is marked light and No. 2-a is marked medium. The two oils are, however, almost of the same gravity, and there is not much difference in the viscosity, and notwithstanding they are so near alike, No. 2-a, which is marked medium, is, in fact, a lighter oil than No. 1-a. These two oils may be compared with brand M, which is also a water-white oil. These three are the only white oils in the list, and we have added the letter to the number to indicate them.

There are some very interesting points to be observed about these three oils:

First, the gravity is almost the same in all three, although they are quite different oils and come from different sources. They are the only oils we so far have with a gravity as low as .8686, and there is only one other oil which has a carbon figure as low as these.

Second, while the gravity is almost the same, the viscosity at 80 degrees Fahrenheit is very different. In brand M we have the viscosity 1.7647, and in brand A, No. 1-a and No. 2-a, we have 4.2857 and 4.128, this alone showing the oils to be quite different, but at the temperature of 350, all three oils are very much alike.

The flash and fire points are of course quite a little higher for the thicker oils.

We may also go a step further and show the total sulphur in brand A. No. 1-a is the lowest we have so far found in any of these oils, being only 0.046 per cent., while that in brand M is 0.049.

We have also determined the heat of combustion of these two oils, and find them very nearly the same, for brand A No. 1-a, we have 19,798 B.t.u. and for brand M we have 19,708 B.t.u. This is the highest heat of combustion we have yet found, and the only other one we have at these figures is brand H No. 1, where we have 19,761 B.t.u., and it is also curious to note that the sulphur in this oil is also low, being only 0.049 per cent. and the carbon is the only low carbon we have, being 0.34 per cent. As brand H is not a white oil, it is quite obvious that we need not select a white oil as giving the best results.

The other oils in this list are of all shades of color, from light to dark, and as a rule the thicker they are the darker they are. All the grades marked No. 1 come labeled light; those marked No. 2, as medium; those marked No. 3 as heavy. These three grades seem to be the most in use and these numbers in the different brands should be compared together. Of the other numbers, Nos. 4 and 5 are special oils, and No. 6 is extra heavy. I will call attention here to brand I No. 3, which is a very thick oil; however the oils in this brand are marked light, medium and heavy.

In comparing the Nos. 1, 2 and 3 of each brand we find the gravity to vary considerably:

In	No.	1	from	.8705	in	brand	F	to	.9153	in	brand J
"	"	2	"	.8756	"	"	E	"	.9108	"	" J
"	"	3	"	.8801	"	"	E	"	.8955	"	" H

In the viscosities at 80 degrees Fahrenheit we find a variation as follows:

In	No.	1	from	2.2500	in	brand	C	to	7.500	in	brand J
"	"	2	"	3.5714	"	"	F	"	9.2857	"	" I
"	"	3	"	4.6071	"	"	C	"	54.6428	"	" I

This would show at once the uselessness of purchasing oil by the brand and grade or by name only, without knowing just what the oil represented really is.

Going back again to the viscosities, we find that in the three grades in all the brands we have a variation in the viscosity at 80 degrees Fahrenheit from 3.2353, in brand A to 54.6428; in brand I a variation of 51.4075, yet at a temperature of 212 degrees Fahrenheit we have a variation of only 2.7500; while still further at 350 degrees Fahrenheit we find only a difference of 0.1428, and this is including brand I No. 3, which has a viscosity at 80 degrees Fahrenheit of 54.6428.

We think there could be very little advantage in using the thick oil, while there certainly would be a great disadvantage in the amount of carbon it would give. Selecting an oil from this table, from the carbon figures, we would pick out brand H No. 1, which has a carbon figure of 0.34, and about the last we would take would be brand I No. 3, with a carbon figure of 2.33 per cent., or nearly 2 per cent. more. This would

certainly overcome any slight increase in the lubricating properties of the thick oil, due to its higher viscosity.

In brand B we have two oils of the same grade, but we notice they are quite different oils. In brand C we find Nos. 1, 2 and 3 in duplicate, and here again we see a large difference not only in the viscosity, but also in the carbon.

It is very possible that this is as close as oils can be prepared on a commercial basis, but this is a point we would like to find out. If they are liable to differ as much as these do in this brand C, it would seem advisable for large users to purchase their oils on specification.

(To be continued.)

Weak Spots in Our Lubricating Systems

THE greatest difficulty found in lubricating a motor is to supply the oil in proportion to the speed at which the bearing surfaces are moving over each other. When two metal plane surfaces are in moving contact the movement is resisted by a variable amount of friction. Sliding contact produces a higher friction than does rolling contact because the area over which the force of friction is exerted is great in the first instance while in the rolling contact the area is practically nil, being merely a point or a line. **As the speed increases, the resistance per unit of time, or, in other words, the power of the resistance is augmented.**

The power that is used in overcoming frictional resistance is transformed to a large degree into heat. **Hence, when the coefficient of friction rises, the heat increases and along with the rise in heat come a consequent rise in the coefficient of friction.** This continues until the resistance becomes so high that the power exerted by the friction is greater than the power utilized in driving the moving parts and the bearing binds and the result is what is known as a seized or frozen bearing.

In a bearing there are two factors which could increase the coefficient of friction where a given amount of oil is supplied. The first is a rise in the temperature of the metal and the second is a poor condition of the bearing itself.

With the above conditions in mind a study of how the oil reaches the cylinder wall is of particular interest. **In the average form of splash system there is a marked tendency towards feeding too much oil at low speeds in order that there will be enough at high speeds. It is a matter of doubt that the amount of oil splashed up by the scoops on the connecting rods increases with the speed.** When the connecting rod is whirled around at high speed it would seem that it would sweep every vestige of oil out of the narrow trough which is generally made to hold it. With such high speed, when the motor is turning over say 1800 revolutions a minute, with the connecting rod passing through the trough every 1-30 part of a second, is it possible to renew the oil in the trough as thoroughly as when the connecting rod is moving at half that speed? Hence, it may well be asked if in the splash system the oil is fed to the cylinders in an increasing ratio with the increase in speed. **If we design the lubricating system for average touring speed we are getting insufficient oil at high speeds and our motor smokes at low speeds.** Can this be overcome by any modification of design such as troughs interconnected with the throttle, being raised and lowered by its motion; or by replenishing the oil supply to the troughs by pumps having a greatly increased delivery at high motor speeds? A small fraction of a second is a short time, and the tendency towards other systems is perhaps the explanation.

(To be continued.)

TABLE B—ANALYSES OF AUTOMOBILE CYLINDER OILS—BY W. JONES

Brand A.	Specific Gravity	Specific Viscosity at 80° F.	Specific Viscosity at 212° F.	Specific Viscosity at 350° F.	Carbon per cent	Flash Point °F.	Fire Point °F.	Acidity	Sulphuric Acid per cent
No. 1 a	0.8686	4.2857	1.4285	1.0714	0.36	440	505	.0029	tr.
" 2 a	0.8616	4.1428	1.3214	1.0357	0.40	436	490	.0030	0
" 1	0.8984	3.2353	1.3214	.....	0.70	384	432	.0044	0
" 2	0.8992	4.1764	1.3571	.....	0.75	404	460	.0059	0
" 3	0.8948	6.1764	1.4285	1.0357	1.03	422	474	.0049	0
" 4	0.8980	4.2857	1.2857	1.0357	0.68	406	452	.0029	0
" 5	0.8968	5.6071	1.3571	1.0357	0.51	418	470	.0029	tr.
" 6	0.8898	58.2142	4.0357	1.1428	1.56	532	610	.0029	0
Brand B.									
No. 2	0.9103	4.4643	1,2500	.....	1.70	428	474	....	0
" 2	0.9117	5.3571	1.3928	1.0357	0.82	428	476	.0034	0
Brand C.									
No. 1	0.8860	2.2500	1.3214	.....	0.65	420	476	.0025	0
" 2	0.8866	3.6428	1.2500	.....	1.00	424	476	....	0
" 3	0.8868	4.6071	1.4285	.....	1.10	428	478	....	0
" 6	0.8874	6.3214	1.4285	.....	1.10	428	490	....	0
" 5	0.8976	18.6071	2.0000	1.1071	2.35	454	526	.0044	0
" 1	0.8846	3.9284	1.2857	1.0535	0.52	440	494	.0030	0
" 2	0.8852	4.4642	1.2857	1.0357	0.43	424	490	.0030	0
" 3	0.8855	5.2857	1.3571	1.0714	0.45	450	500	.0030	0
Brand D.									
No. 1	0.8747	3.8571	1.4285	.....	0.44	438	494	.0029	0
Brand E.									
No. 1	0.8953	5.1428	1.2857	.....	0.52	412	464	....	0
" 2	0.8756	4.1085	1.3571	.....	0.70	434	490	.0103	.0324
" 3	0.8801	7.5353	1.5357	.....	0.93	450	506	....	.0223
Brand F.									
No. 1	0.8705	3.3928	1.2143	.....	0.55	440	494	....	0
" 2	0.8777	3.5714	1.2500	.....	0.78	438	486	....	0
" 2	0.8738	3,5714	1.2500	.....	0.53	442	494	.0123	.0286
Brand G.									
No. 1	0.8821	3.2857	1.2142	1.0535	0.42	428	484	.0034	0
" 2	0.8884	5.3571	1.4285	1.0714	0.70	458	516	.0044	0
" 3	0.8844	7.3214	1.5000	1.0714	0.70	458	518	.0034	tr.
Brand H.									
No. 1	0.8712	4.0714	1.3214	1.0714	0.34	448	506	.0034	0
" 2	0.8901	4.3214	1.2875	1.0714	0.70	436	476	.0034	0
" 3	0.8955	5.8928	1.3571	1.0792	0.83	456	518	.0030	0
Brand I.									
No. 1	0.8764	3.9285	1.3214	1.0357	0.50	452	504	.0034	.0076
" 2	0.9014	9.2857	1.5000	1.0535	0.96	436	494	.0030	0
" 3	0.8941	54.6428	3.9642	1.1785	2.33	546	624	.0039	0
Brand J.									
No. 1	0.9153	7.5000	1.4285	1.0357	0.51	396	424	.0034	0
" 2	0.9108	7.8571	1.4642	1.0357	0.91	440	492	.0039	tr.
Brand K.									
No. 2	0.8862	5.5000	1.3571	1.0714	0.68	436	476	.0039	0
" 6	0.8847	18.2857	1.8214	1.1250	1.30	478	530	.0039	0
Brand L.									
No. 1	0.8719	3.4642	1.3392	1.0357	0.54	440	480	.0034	0
Brand M.									
No. 1 a	0.8684	1.7647	1.1428	1.0357	0.30	325	358	.0029	0

3-Point vs. 4-Point

Discussion of Relative Merits of These Systems for Motor and Gearbox Support Continued from Last Week

Dunham Favors Four-Point System and Cites Many Advantages—Souther Leans to Three-Point

Part II

Henry Souther Expresses His Views

George W. Dunham Emphatic for Four-Point

J. G. Perrin States Four-Point Merits

Chester S. Ricker Talks for Three-Point

Stewart McDonald Believes in Four-Point System

HARTFORD, CONN.—Editor THE AUTOMOBILE:—Regarding three-point as compared with four-point suspension for motors and gearsets, my inclination as an engineer has always been for the former, and I have assisted in the design of cars using it and have used cars myself so constructed. I know that it is a good thing only if properly applied.

The principle, I have felt, is right, because it is impossible to make a rigid frame and not very practical to make a motorbase or a gearbox strong enough to prevent the frame or its supports from yielding and bending.

I have seen many four-point suspension engine legs and gearbox legs broken by the flexing of the frame and because the application of the four-point support was not good.

Four-point suspension can be applied so as to permit enough motion to relieve all strains from engine base of gearbox; in fact, that is done by several cars of well-known construction. At the same time, I believe the three-point suspension is the easier to construct and therefore, all other things being equal, the better.—HENRY SOUTHER, Consulting Engineer.

Finds Four-Point System Best

DETROIT, MICH.—Editor THE AUTOMOBILE:—Just a few words in plain English, eliminating technical expressions: On the face of it, it would appear that three-point suspension is the only construction worthy of consideration. Theoretically, anything but three-point suspension is unmechanical, but actual experience demonstrates that four-joint suspension is undoubtedly the most all-around satisfactory.

Examination of the automobile as it is built today shows that four-point suspension is the best accepted practice. This suspension, four-joint, is undoubtedly possible, only on account of the extreme flexibility of an automobile chassis, and while it would seem that a motor bolted down to the frame at four points is bound to be sprung out of shape, on account of the giving of the frame, in actual service just the reverse is true—the frame supplying the flexibility and the motor holding practically rigid.

There are so many advantages connected with the four-point method that it would seem the three-point suspension must have originated from one of three causes: First, theorizing; second, lack of rigidity in motor design and construction, and, third, desire of the engineers to construct the car theoretically correct in every detail, rather than obtaining the results by the most direct means.

There are a number of cars with so-called three-point suspension, but, in fact, there are very few embodying this construction. I have in mind a motor supported at one end by means of feet extending out onto the frame rails, and at the other end there is a rigid cross-member, to which the motor is securely bolted by two bolts in close proximity. This would seem to be three-point suspension, but if one stops to consider the securing of the end with two bolts close together makes a rigid suspension and is practically the same as four-point insofar as all practical results are concerned.

In argument for and against the two methods, I merely wish to call attention to the fact that in machine construction, often those which appear unmechanical are the best, and where there is but little difference one way or the other, the simplest and the shortest cut to the result is undoubtedly the most advisable method.

I believe that in the contest work during the entire history of the automobile, in practically every case where a large number of events were entered and a large percentage of these events won, the suspension was four-point.

To sum up the situation in a practical way, and that is the way in which the average automobile buyer looks at it, the following are a few points, the consideration of which should give one a fair idea of motor suspension:

First—A big majority of successful racing contest cars have four-point suspension.

Second—A big majority of the best cars built today have four-point suspension.

Third—The motor with four points of suspension is more stable and less inclined to rock under heavy loads under varying conditions.

Fourth—The three-point suspension is undoubtedly theoretically correct, just as much as the sliding gearset, which is universally used, is absolutely unmechanical and opposed to all theory.

Would not careful consideration of the above lead one to choose the four-point construction?—GEORGE W. DUNHAM, Chalmers Motor Company.

Disapproves of Flexible Mounting

DETROIT, MICH.—Editor THE AUTOMOBILE:—My experience with three-point suspensions has not been very favorable either with engines or unit power plants, where the point of the triangle is on the front cross member.

With the fore-door type bodies and enclosed jobs, I have ob-

tained much greater satisfaction with a good, rigid frame, the motor and gear-box being fastened thereto very rigidly, than where schemes for flexible mounting have been used.

Of course, with a rigid frame having power unit and body fastened to same more or less rigidly throughout, a very easy spring suspension is advisable, and, in fact, almost a necessity.

On light cars, of course, things can be done in the way of flexible suspensions which would not work out so well on larger and heavier cars. We found in racing, and especially in 24-hour races, that we got much better results where the engine was fastened to the frame at four points than where we tried to arrange for a flexible mounting of engine.

I do not imagine a more severe test can be made to show up faulty construction of power plant and frame and axle than during the latter half of a 24-hour race when track at corners especially is only a little better than a plowed field.

I might qualify the above description of our engine mounting as regards the power plant being rigidly fastened to frame by stating that the two front engine arms are hung on brackets of sheet metal which are more or less flexible and the engine arms are not therefore directly attached to side members of frame.—J. G. PERRIN, Lozier Motor Company.

—

Illustrates Three-Point's Advantages

INDIANAPOLIS, IND.—Editor THE AUTOMOBILE:—It has been utterly impossible for me to give you any story on three-point suspension, but I instructed a photographer to get some photographs which I feel will explain more than anything I could say regarding the advantages of three-point suspension.

You will note from the front view of the car, Fig. 1, how much the car has been distorted in order to show the effect of exceedingly rough going on the motor car chassis. The diagonally opposite wheels in this case have been raised 10 inches in order to obtain the effect shown. As a measure of the distortion, you can notice the position of the center of the starting-crank shaft. This normally is at the center of the slot in the front cross-member. In the photographs this actually touches the side of the slot. That means that the motor has been twisted over to one side very nearly 1 inch, yet I readily cranked the motor, proving that none of the bearings was in the least pinched by this distortion. This is a proof that the three-point suspension is certainly worth while.

The second photograph, Fig. 2, shows the method of supporting the motor and the trunnion at the front of the motor is shown through the fan. In this photograph you can gain some idea of the construction, some of the points of which I will enumerate below.

The rear supporting member for the motor is only held in place by two bolts, one of which is shown at the rear end of the crankcase. The weight of the motor is carried, however, on the long rectangular projection milled on the rear end of the crankcase. This projection is horizontal and extends the full width of the aluminum case.

The steel cross-member which fastens on this is slotted so as to receive the projection on the crankcase. As a result the motor support has a bearing 1.5 inch wide and about 14 inches long, thus relieving the bolts from any shearing strains.—CHESTER S. RICKER, Henderson Motor Car Company.

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Four-Point on Four-Cylinder Cars

ST. LOUIS, MO.—Editor THE AUTOMOBILE:—There are a number of conditions present in the four-cylinder motor which call for greater rigidity than with the six-cylinder, and hence a stronger, more rigid form of support is considered essential by us.

With the four-cylinder motor there is more vibration due to the unbalanced relation of the connecting-rods at the upper and lower dead points, because of their angularity.

This vibration is best cared for, we think, by providing four-point support for the engine when it is a four-cylinder.

Then, too, the distortion of the frame due to uneven roads does not seriously affect a four-cylinder motor because the cranks are 180 degrees apart.

With the six-cylinder motor the vibration is more effectively eliminated both with respect to unbalanced forces and unbalanced couples, and hence three-point suspension affords ample support and vibrational resistance.

Furthermore, the cranks of the six-cylinder engine being only 120 degrees apart, the frame distortions due to road unevenness are more serious in their effects.

For these reasons we utilized four-point suspension on our four-cylinder motors and three-point suspension on our six-cylinder motors.

Another element to be considered, of course, is the increase in the frame distortion effect upon a motor which measures longer—the effect upon a four-cylinder being much less than upon a six-cylinder of the same stroke and bore.—STEWART MCDONALD, Moon Motor Car Company.

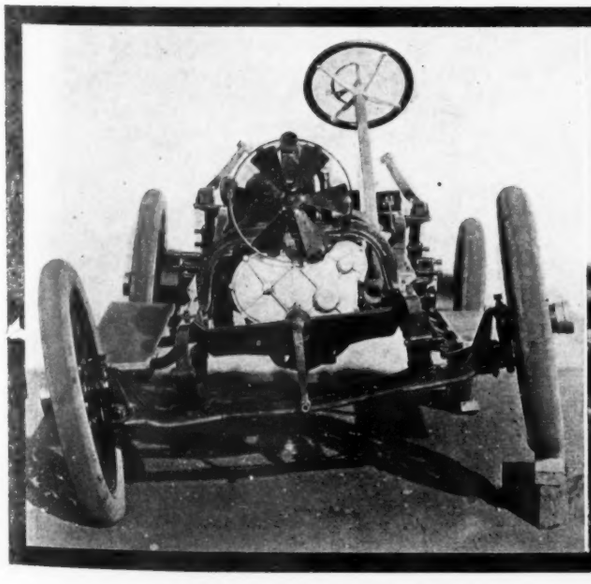

Fig. 1

Fig. 2

Importance of Proper Weight Distribution; Priming Device for Acetylene; Cannot Start His Motor; Ether as a Priming Agent; Shellacked Hose Hard to Remove; Removing Carbon from Opposed Cylinders; Toe-In Explained

Weight Distribution Important

EDITOR THE AUTOMOBILE:—Mr. MacNutt does some designs of cars an injustice when he says that it is necessary to use chains to get traction. It is all a matter of proper weight distribution. If the larger portion of the weight is on the rear and the engine nearly able to wind the front end up into the air as it tries to turn the rear axle then a condition is produced where practically all the weight is on the drivers and they will take that rig anywhere. I do not know when the buying public will learn this simple fact, but I live in hope that they will some day. They talk quite learnedly about four-wheel drives, but what is the use of a four-wheel drive when it is possible to carry practically all the weight in the driving wheels and get nearly the same result anyhow?

I must disagree with him as to the effect of chains on the tires. I submit that a road made of chains will wear out the tires much faster than a smooth road, and I fail to see any difference if the wheel carries the chain instead of the road carrying it. That a chain fixed across the tire will quickly wear it out, no one denies. That a loose chain does not hit twice in the same place and so does not make its damage apparent so soon is also true, but that the wear caused by chains "is inappreciable" I do not believe. Weight on the driving wheels is the right answer. If Mr. N. will inject a teaspoonful of sulphuric ether and gasoline in equal parts into his cylinders he will get results on cold mornings.

Saginaw, Mich. CHARLES E. DURYEA.

—Distribution of the weight is important, but it would seem that for traction the co-efficient of friction between the vehicle and the road would be even more important.

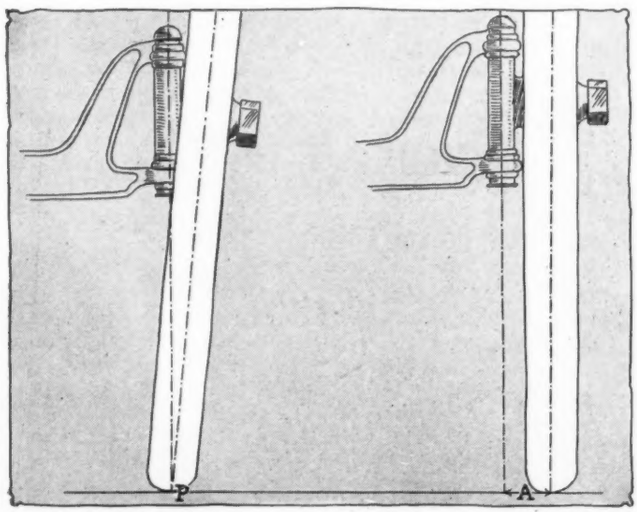

Fig. 1—Diagrammatic view of two conditions of front wheels

Reader Suggests Priming Device

Editor THE AUTOMOBILE:—Kindly advise me through Letters Answered and Discussed is there a priming valve made which accomplishes the action I describe and partly illustrate in accompanying sketch. I mean a valve, such as in Fig. 2, which will allow acetylene gas to flow into the inlet manifold, thereby filling the cylinders with gas, if it is pressed just previous to switching off the current on stopping the motor. That should leave the cylinders filled with gas and ready to explode when battery current is applied to the plugs. At the same time the button on the dash should be pressed, giving engine a good start. Should the car stand long in a cold garage, as in my case, and gas escape from the cylinders one could pull up on the starting handle and the same time pull a little wire hook in front of the radiator which would release the valve and allow entrance of gas into the cylinder, thereby making starting easy. I have been using a device, Fig. 3, which was described in THE AUTOMOBILE about a year ago and which has saved me many an hour of back-breaking work in trying to start the motor on cold mornings, but I wish to improve on that.

New York City. R. H. PANKOW.

—There are many devices on the market such as you have described, most of them being used in connection with starters. With such a device it would not often be necessary to crank as the gas would enter the cylinder if the valves were opened just before the motor stopped after the spark was turned off and would remain there at atmospheric pressure for a long time. It would be merely necessary to start on the spark in probably 75 per cent. of the cases in which the motor was warm. In cold weather the addition of such a priming device would be valuable. The device you mention as having tried with success is merely another application of the same principle and has been used with success by many motorists.

Motor Will Not Start

Editor THE AUTOMOBILE:—Would you kindly tell me how to remedy the following trouble:

The engine of my car cannot be started. Priming does no good, the engine does not give a single explosion. Carbureter has been opened and closed, but it does not seem to have any effect.

The plugs are in A1 condition. I am using a Holly carbureter on a four-cylinder Wood car.

Plainfield, N. J. READER.

—There are but two conditions necessary for securing an explosion in the cylinder of a motor. The first is that you have an explosive charge within the cylinder and the second is that you have a spark to explode it. To secure continuous explosions is another matter, as this brings in all the functions of the motor. To secure the first condition, however, requires but the two necessities mentioned. Since you are unable to get any explosion at all your problem is one in which these two factors are to be considered.

An explosive charge may be introduced into the cylinder through the priming cup. The addition of four or five drops of ether to each cylinder will also tend to make this charge more explosive. If this is done on each cylinder and you find that on turning the motor over you get no explosion, you may attribute the trouble to the fact that the ignition system fails within the cylinder in spite of the fact that the spark-plugs are evidently in the best of condition. Remove the plugs from the cylinders and lay them upon the tops of the cylinders so that the metal on the outside of the plugs is in contact with the cylinders. Turn the motor over slowly by hand and see if there is a spark at the gaps on all four cylinders. Note the sparks carefully and see if they are bright, live flashes. This can be done better in the dark. If they are not good on either the battery or magneto, the points are too far apart and should be moved more closely together. Examine all the wiring connections and see if they are tightly and carefully made. Much current can be lost through a poor connection.

If you are using battery ignition, see if it measures up to the required strength of 6 volts. Then follow along the wiring to the coil. Note if the ground connection is good. This is often a source of weakness. See if the vibrator points are adjusted correctly. When the switch is on, a steady hum like the buzzing of a bee should emanate from the coil box. If not, dress platinum points flat by filing lightly and turning the adjustment screw until the hum is of the correct pitch. If coil is not right send it to the maker for repair, as the chances are decidedly against your improving it by attempting to disassemble it.

If, after putting the ignition system in good order and introducing an explosive charge into the cylinder, the motor does not fire regularly all the symptoms and notes possible should be made and forwarded to this department for a further explanation.

Believes in Use of Ether

Editor THE AUTOMOBILE:—I notice in the issue of November 7 a discussion regarding the use of ether in gasoline to offset the effect of bad gasoline. I beg to advise that my experience had been that 10 to 12 ounces of ether, added to 10 gallons of gasoline, makes the gasoline operate about as well as the highest-grade gasoline that can be bought. I have introduced this amount into mine and 10-cent gasoline. Commercial ether is very cheap, costing only about 18 to 20 cents a pound.

There is practically no water in commercial ether and its affinity for water is so great that it will saturate and practically eat up any small amount of water which there is in the gasoline. I have been able to run an automobile engine experimentally in 60 per cent. water and 40 per cent. ether.

Milwaukee, Wis. P. C. AVERY.

—In view of the general prediction of a rigid winter and also taking cognizance of the growing desire of the automobilist to use his car in the winter as well as the summer, the opinions of those who have had experience with ether both as a priming agent and as a factor in increasing the value of low-grade fuel, become distinctly valuable. THE AUTOMOBILE would welcome any ideas on this subject, as they would assuredly be of value to a large body of automobilists who refuse to put their cars in dead storage in spite of the vigorous onslaughts of Jack Frost.

Removing Shellacked Hose

Editor THE AUTOMOBILE:—If you know of anything that will remove a hose that has been fastened on with shellac will you kindly publish it in THE AUTOMOBILE.

Niagara Falls, N. Y. R. N. PATTISON.

—If you have an old hose the best advice would be to cut it off and put a new one on, because you will find that even after you have got it loose it will crack when you attempt to slip it off the metal connections. On the other hand, if you have a hose connection that is fairly new, take an old hacksaw blade and run it along an emery wheel to take off the teeth and then thin it down a little more at one end. This will be very flexible and by its aid and with the assistance of what alcohol you can work beneath the rubber with the hacksaw blade you can probably work it loose. If you once get it started the rest will come easily.

Cleaning Buick Cylinders

Editor THE AUTOMOBILE:—Could you tell me through the columns of THE AUTOMOBILE how to clean the cylinders of my model 14 Buick? Also how to fix it up for the winter.

Birdell, Pa. J. NORVIN HATFIELD.

—The Buick two-cylinder opposed motor is of the horizontal type and would seemingly present problems that would render it difficult to clean. This is not the case, however, as it can very well be scraped through the valve cover plates in the same manner as would be pursued with a vertical motor. The plates are taken off and scrapers of various shapes used until every point has been reached. To do a thorough job, however, with any motor the best way is to take it down and remove the cylinders. When this is done there will be no difficulty in reaching every point. If you are not going to run the car during the winter it will require but little attention. It would be a good plan to enamel the motor if the old enamel is worn off and to apply a coat of cylinder oil to all the exposed bright parts. Some oil should be injected into the cylinder and the motor turned over by hand once or twice to keep the cylinder in good condition during the winter.

If you are going to use the motor during the winter the compression should be tested by noting the resistance to turning the motor over by hand or by trying the car on various hills to see if the climbing powers are what they should be. If not, the cleaning of the cylinder and the grinding of the valves will be enough to restore the power in most cases. Clean out the old oil from the reservoir and replenish with new. Clean the spark-plug points. Tighten all the loose nuts throughout. Look at all water and other connections to see if there are any leaks. If there are, remove them by replacing gaskets. Try the ignition system after the plugs are clean and the wiring has been inspected, taking careful note that the batteries are of the proper strength. If any trouble develops it will probably be in the connections. These are a few points which must be noted. Others will occur in looking over the car for in a model as old as this there are sure to be some parts that are worn and which will have to be replaced.

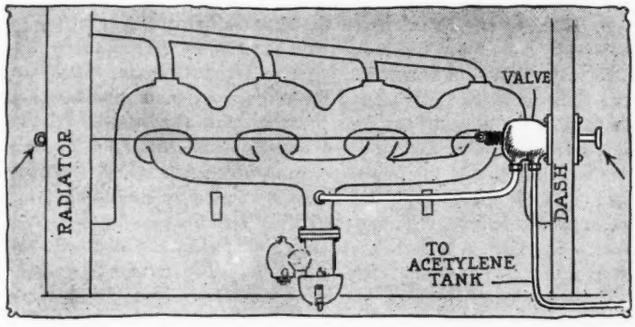

Fig. 2—Priming device for use with acetylene suggested by reader

Mounting of Front Wheels

Editor THE AUTOMOBILE:—Would you please give me the following information in regard to front wheels?

1. When one is standing looking at the automobile from the front what is the angle or degree at which the wheels are tipped, approximately?

2. Why is this done and what good is it?

3. Looking forward are the front wheels pointed straight ahead, and why?

4. Looking forward are the front wheels toed in a little toward the center, and what for?

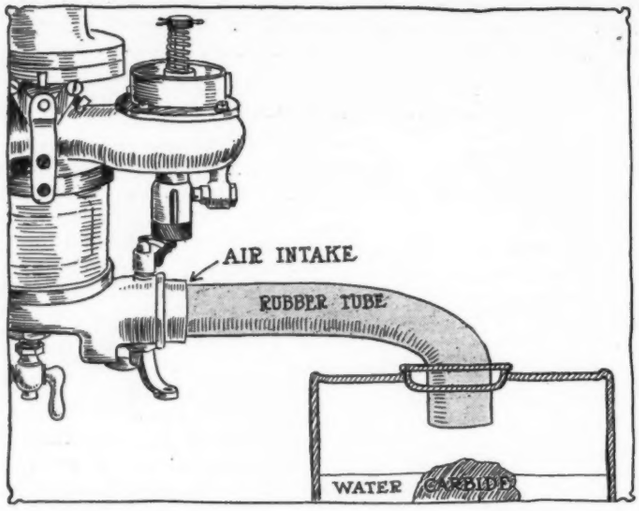

Fig. 3—Easy starting device which has been used with success in many garages

5. This last question is per the sketch, Fig. 1, as though the wheels pointed to a point away off in the distance.

Hartford, Conn. HARRY ALLEN.

—1. At about 3 degrees to the vertical.

2. This is done to minimize the shocks that are carried up to the hand steering wheel. As may be seen in Fig. 1, there are two ways shown in which the front wheels may be mounted. In the right view the line through the center of the steering knuckle is parallel to the line through the center of the wheel. In the left view the line through the wheel meets the line through the steering knuckle at P. the point at which t he wheel has contact with the ground. The difference in the two mountings will be apparent from a minute's study. Where the two lines do not intersect there is a small arm A representing the distance between the two parallel lines. Any impact between the wheel and an obstacle produces a turning moment about the steering knuckle which will be equal to the product of the force multiplied by the arm. Where this arm is zero, as it is when the two lines intersect at the point of contact between the tire and the ground, there can be no moment and hence no shock transmitted to the steering wheel from a straight-on contact with any object.

3. They are pointed straight ahead. That is the distance between the front ends of the two wheels is the same as the distance between the rear. If it were not so the tires would be rapidly worn away as they would be pusheed over the road and would not roll perfectly.

4 and 5 are answered under question 3.

Automobile Axle Conditions

Editor THE AUTOMOBILE:—Few owners of automobiles realize the important part that the rear system plays. In fact, most owners think that it is only a minor part of the car and that so long as the engine runs smoothly they are running their car under ideal conditions. This is largely due to the fact that most parts of the engine are reciprocating, while those of the axle are rotating. The former causing knocks; the latter causing almost any kind of a noise from a rattle to a groan.

How many buyers of cars today realize the importance of the rear housing? Few at least are ever posted as to their weaknesses by the agents, who oftimes does not know himself and consequently cannot post any one else.

But here are a few important features to be considered:

1—General design, which includes:

1. Shape.
2. Distance of spring seats from center of wheel.
3. Strength.

2—We must consider the brakes, which should always be powerful enough to hold the car and at the same time not powerful enough to grab or slide the wheels. I am inclined to think that most brakes are too powerful and consequently increase the tire cost. In the selection of any axle the greatest of care should be exercised to get away from the grabbing spoken of before and also the rattle which sooner or later will occur. A heavy lining should be used on all contracting brakes to protect the brake shoe from excessive heat, thereby causing the paint to crack off.

Internal expanding brakes are not advisable in that they are not accessible should the lining wear and begin to roll, neither can they be gotten to easily enough to insure proper lubrication on the operating bars.

The bearings should be of such a type that they can be easily taken up. This not only applies to the wheel, but also to the differential and pinion-shaft bearing. All bearing retainers and carriers should have a ground fit so that they are forced about .001 or .002 of an inch, according to the load they are to carry.

If the bearings are of the radial or cup-and-cone type they should by all means have line contact, of course. They should have a load factor of something like 300 per cent. in order to insure them against certain sudden shocks which occur from time to time.

If the buyers of cars will consider the above carefully they may save many hours of trouble and perhaps many dollars.

Wyoming, O. J. E. BRANSON.

Correct Way to Adjust Schebler

Editor THE AUTOMOBILE:—In THE AUTOMOBILE for October 24, and also in an issue of some months ago, you gave instructions for adjusting model L Schebler carbureter. Your instructions for adjusting low speed were to turn needle valve to the right until closed. Then to turn to the left about a turn and a half.

After having failed to adjust a new model L by these instructions, I got from the Schebler company a copy of their instructions. Their instructions for adjusting low speed were—after closing needle valve—to turn to the left from four to five turns. I tried this method of adjusting and found that it worked satisfactory on my carbureter.

Little's Mills, N. C. J. P. LITTLE, JR.

The Best Non-Freezing Solution

Editor THE AUTOMOBILE:—Would you please tell me the solutions that are commonly used in preventing the water from freezing in the radiator.

Detroit, Mich. CARL SCHNEIDER.

—In the issue of October 24, the question of non-freezing solutions was fully taken up and the merits of all the solutions was explained. A digest of the remarks in that issue follows:

—There are three well-known anti-freezing compounds which have been used extensively and which have proved themselves to be valuable for this work. They are alcohol, glycerine and calcium chloride. Besides these there are many others that are good, but they nearly all have some drawbacks that prevent them from being as useful as would otherwise be the case.

About the most popular of all the solutions to use in the motor is the alcohol. Wood alcohol or denatured may be used. The cost is small; denatured alcohol may be purchased for 60 cents per gallon and the price of wood alcohol is about the same. The advantages of alcohol are that it is very easily handled and that there is no action on the metallic parts of the circulating system.

Taking wood alcohol alone the following solutions may be used:

Freezing Point	Wood Alcohol	Water
+ 5 degrees Fahrenheit	20 per cent.	80 per cent.
0 " "	25 " "	75 " "
— 5 " "	27 " "	73 " "
—10 " "	31 " "	69 " "
—15 " "	35 " "	65 " "
—20 " "	38 " "	62 " "

When using denatured alcohol the freezing point will be different. In tabular form for temperatures between 5 above and 20 below zero Fahrenheit, the denatured alcohol solutions will be as follows:

Freezing Point	Denatured Alcohol	Water
+ 5 degrees Fahrenheit	24 per cent.	76 per cent.
0 " "	29 " "	71 " "
— 5 " "	32 " "	68 " "
—10 " "	34 " "	66 " "
—15 " "	37 " "	63 " "
—20 " "	40 " "	60 " "

Glycerine possesses many characteristics which would seem to stamp it as the ideal non-freezing agent. The boiling point is high and, as will be seen in the diagram Fig. 7, does not change the boiling point of the mixture regardless of the percentage added to the cooling water. Glycerine reduces the freezing temperature materially when added to the water, but does not do so as rapidly as wood or denatured alcohol.

When reducing the freezing temperature to such an extent that the water will not freeze in a cold climate it is necessary to add so much that the water tends to become gelatinous and for this reason it has been mixed very often with wood or denatured alcohol in a very successful attempt to combine the merits of the two. When glycerine alone is used the mixtures that are required for different temperatures will be found in the following table:

Freezing Point	Glycerine	Water
+28 degrees Fahrenheit	10 per cent.	90 per cent.
+15 " "	30 " "	70 " "
+ 5 " "	40 " "	60 " "
0 " "	48 " "	52 " "
— 5 " "	54 " "	46 " "
—10 " "	58 " "	42 " "

When the glycerine and alcohol are used together they are used in equal quantities. This mixture, which is purely mechanical, has not as great a tendency to rot the hose connections as a pure glycerine solution would have. It has more water in it than would the latter and is thus more free to pass through the radiator and other parts of the circulating system without doing harm. On the other hand, there will be less alcohol in this solution than there was in the pure alcohol solution and the result of this is that there will not be so much evaporation and necessary replacement of the cooling fluid after the motor has been run for a time. The glycerine and the alcohol are stirred up together and added to the water in the following proportions:

Freezing Point	Mixture	Water
+20 degrees Fahrenheit	15 per cent.	85 per cent.
+15 " "	20 " "	80 " "
+10 " "	24 " "	76 " "
+ 5 " "	27 " "	73 " "
0 " "	29 " "	71 " "
— 5 " "	30 " "	70 " "
—15 " "	32 " "	68 " "

We now come to calcium chloride, $CaCl_2$, and water. This compound has been recommended by many and is very good, although it has its dangers in the difficulty of securing the chemically pure article. In buying the calcium chloride for use in the cooling system of an automobile the crude article costing about 10 cents a pound should not be purchased. The chemically pure article costs about 25 cents a pound and is very satisfactory. The objections to the use of the material is its tendency to set up an acidic action in the radiator. Chloride of lime, which should be kept out of the radiator, is often a constituent of the commercial calcium chloride and care must be used in getting the chemical from a reliable concern who will guarantee the purity of their products. With the calcium chloride solution the percentages are given by weight instead of volumes as are the other tables:

Freezing Point	Calcium Chloride by Weight	Water by Weight
+10 degrees Fahrenheit	15 per cent.	85 per cent.
+ 5 " "	17 " "	83 " "
0 " "	19 " "	81 " "
— 5 " "	21 " "	79 " "
—10 " "	22 " "	78 " "
—15 " "	23 " "	77 " "
—20 " "	25 " "	75 " "

His Alcohol Evaporated

Editor THE AUTOMOBILE:—The writer has read your articles on Experience of the Automobilist in Cold Weather.

The latter part of December, 1911, I filled the radiator with 1-3 alcohol and 2-3 water, and thinking I was absolutely safe in not having my radiator frozen, I left the car out frequently.

For a week or so I had no trouble with my radiator freezing, but one very cold evening about the first of January I left the car in front of my house as usual, and when I came out and started the engine, I found the pump and radiator frozen solid.

I made a test of the solution that was left in the radiator, and found about 5 per cent. of the alcohol left in the water, this, of course explains why it was frozen.

New York City. D. L. MOORE.

—This is a natural experience and one which is to be expected when using any of the alcohols. It is really necessary to use a hydrometer with an alcohol solution in order to note the changes in specific gravity on account of the evaporation. The specific gravity of the mixture when the alcohol is first added should be noted and then at frequent intervals samples may be drawn off and should any change be noticed alcohol should be added until the solution is restored to its former condition.

In THE AUTOMOBILE for October 24 this problem was taken up along with many other considerations of the cooling problem in winter months. An instrument which was particularly adapted for telling the freezing point of a mixture was described. It may be stated that this was simply a hydrometer that was scaled off to read in freezing points instead of specific gravities.

Self-Starter for Ford Car

Editor THE AUTOMOBILE:—Please advise me what self-starter is practical for the Ford car.

Tolu, Ky. V. HARTON.

—Practically any of the acetylene starters could be fitted to your Ford car with very little expense. There are many of these on the market that give entire satisfaction selling as low as $10. They are connected to the acetylene supply and have attachments which fit on the top of the cylinder in place of the priming cups. The gas is controlled from a valve on the dash which admits a supply of gas to the cylinders and fires the charge when the ignition is switched on. One of the spring starters which automatically spin the motor until it starts could be fitted.

Although it would be well within the realms of possibility to install an electric or air system, these two would cost you so much that the two above systems would probably be the only ones to consider. The spring starter has the advantage of starting the motor while on dead center and the acetylene the advantage that in case the motor fails to start for some reason at first you will not have to get out and wind it up.

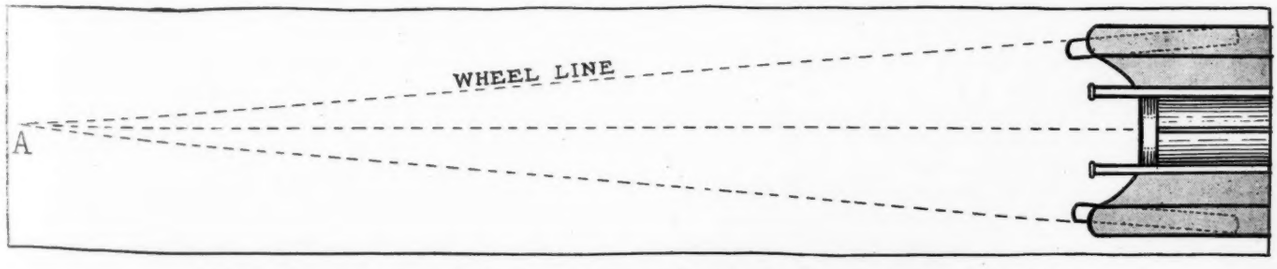

Fig. 4—Improper condition of the wheels. When this is true the tire wear is exceedingly rapid

The Automobile

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The Annual Model

WHETHER the annual model is for better or for worse is still an unsettled question with automobile makers. Many of them imagine they have settled the question, but when their conceptions on the matter have reached the final analysis it is evident that they still desire many of the advantages that accrue from the annual model. There are some makers who would like the public to understand that they are opposed to the annual product because by such a course the impression is spread broadcast that their models are sufficiently perfected and an annual overhauling of them is not necessary to keep them in the forefront.

At the present time the American automobile is not a sufficiently perfected machine to warrant the elimination of the annual model. There are nearly twenty unsettled designs in connection with our automobiles. The question of self-starters is so far from its final form that many makers will have to change from season to season before an unchanged product has been evolved. To-day the ignition system is not in its last and final stage. In Europe the majority of the manufacturers are fitting a single magneto without any auxiliary system such as battery or dry cells. In America the concerns using the magneto as the only system are so few as to constitute a hopeless minority, yet it is almost a safe statement to make that within five years one single system of ignition will suffice just as one carbureter, one oil pump, one water pump or one clutch does to-day.

American automobile makers are not settled, in fact, far from it, on the question of rear axle construction. All of them are looking into the question of reducing the unsprung weight of the axle, some are introducing worm drive instead of bevel drive and others are making numerous changes. These questions will have to be wrestled with for years to come. The history of Europe in such matters will be repeated in America.

It is true that the annual model has worked some ills, but many ills have been attributed to it for which it has not been responsible. If the annual model has been responsible for different concerns adopting different accessories, that has been purely a business proposition with such houses. The annual model has been blamed for the landslide towards the acetylene starter of last year, which form of starter has again gone out so prominently since then. Granted that it played its part in this field it cannot be denied that **the sooner an accessory is conclusively proven unsatisfactory the better.** It is much preferable to have such a decisive verdict reached within 12 months than to require 36 months to get it.

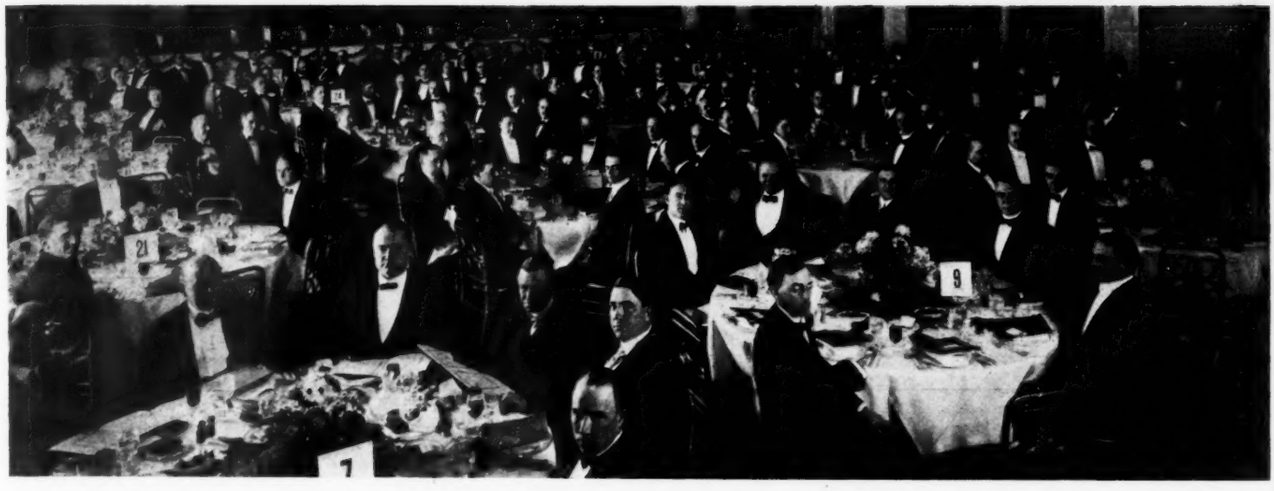
So long as automobile shows are continued so long will it be necessary to have the annual model. If the annual model is discontinued and cars exhibited at the 1913 shows are the same as those seen at the 1912 shows, then the public will stop attending shows, and the show will surrender its mammoth advertising value.

It is difficult to see why certain concerns are opposed to the annual model when in the same breath they acknowledge that they must continue making changes in their present models. So long as these changes are frequent, as they will be for some years to come, it will be necessary to adopt new models, new series, new numbers—it really makes little difference as to what the particular nomenclature is.

To the buyer it will facilitate matters if there is some symptom of similarity in the time when these are announced. There must always be a cleaning up of one model and a beginning of the next, so far as the factory is concerned; and when it comes to the dealer it will be necessary for him to announce his new number, new series or new types to his clientele. If the dealer makes such announcement to his own injury that cannot be helped. He is his own keeper and is responsible for his own deeds.

It is unjust to tie to the annual model abuses in the business that are due to other causes. It is quite impossible to consider the annual model as responsible for the business system a dealer has in his salesroom. A good dealer will be a good dealer in spite of annual series or types; and a poor dealer may only find in the annual model an excuse for the failure of his business.

It must be acknowledged that the early announcement of the annual model has worked an injury due to the apparent disrupting of the selling field when the warm days of spring are coming and sales should be greatest. Often these stoppings of sales have not been as great as imagined, but they form a by no means negligible factor.



Gathering of 250 members and guests of the National Association of Automobile Manufacturers at the banquet held at the Hotel Pontchartrain, Detroit, Mich.

Heads of Industry Meet as N.A.A.M. Holds Its First Big Mid-Year Convention at Detroit

Manufacturing and Selling Corporations Are Represented and Hear Speeches and Discussions on Various Subjects, As Experts Deal with Pertinent Topics During 2-Day Session in the Capital of the Automobile Industry

DETROIT, MICH., Nov. 16—The first mid-year convention of the National Association of Automobile Manufacturers was held at the Pontchartrain Hotel November 14 and 15. It is doubtful if the association ever held a more successful meeting, in the light of the large number of prominent manufacturers who were present, the fund of valuable knowledge which was imparted, the important business transacted and the results accomplished.

The convention was opened Wednesday, November 13, with a meeting in the afternoon of the executive committee of the association, composed of W. E. Metzger, president; S. D. Waldon, W. C. Leland, R. D. Chapin and Hugh Chalmers, Detroit; W. T. White and L. H. Kittridge, Cleveland; Alfred Reeves, New York; H. H. Rice, Indianapolis; G. W. Bennett, Toledo, and S. A. Miles, Chicago.

However, it was not until Thursday morning when the general sessions commenced that the greater number of the members arrived.

This day was taken up with the reading of various authoritative papers and discussions, while in the evening the Detroit members tendered to those from out of town, and to other invited guests, a most enjoyable banquet in the auditorium of the Pontchartrain. About 250 attended the affair, and in addition to the many interesting speeches a variety of entertainment was provided. A. E. Larned, former president of the Detroit Board of Commerce, acted as toastmaster, while at the speakers' table were Henry Ford, Hugh Chalmers, W. E. Metzger, H. B. Joy, Thomas Henderson, L. H. Kittridge, R. E. Olds, H. O. Smith, Hal Smith, James Keena, George T. Moody, L. W. Goodenough, J. C. Wetmore, E. B. Boyd, Nat Duke, and J. N. Willys.

On Friday morning several more papers were presented, and in the afternoon an important conference between leading representatives of the railroads and the members brought the actual business of the convention to a close.

A number of the visitors remained over until today in order to visit some of Detroit's many interesting automobile and parts factories.

The Detroit Committee on Arrangements for the meeting was composed of William E. Metzger, Flanders Motor Company; Hugh Chalmers, Chalmers Motor Company; S. D. Waldon, Packard Motor Car Company; R. D. Chapin, Hudson Motor Car Company; W. C. Leland, Cadillac Motor Car Company, and H. W. Ford, secretary, Chalmers Motor Company.

The first speaker on the program at the opening session on Thursday morning was S. A. Miles, general manager of the National Association, who outlined its past work, its present objects and its future. He explained the reasons for holding the convention at this time when manufacturers are not busy with shows. Meetings held during the show season do not furnish the members a suitable opportunity to get together, to know each other and to ascertain what is going on in the association and in the world of automobiling, and to get out of the association the full benefit of the advantages it offers.

In his talk, Mr. Miles considered the history of the association for the special benefit of the newer members. The association was organized November 10, 1900, at the first show held in New York. The first executive committee meeting was held on December 3, 1900, and the body was incorporated May 4, 1904. The industry was then a mere dot in the world of commerce. There were about a dozen manufacturers, a few experimenters and a few importers.

Mr. Miles traced the course of the National Association during the days when the Selden patent was in force. Although the association never had any connection with either the licensed or unlicensed faction, and had in its ranks mem-

bers of both sides, it was the victim of circumstances, and with the formation of the two rival bodies, commonly called the licensed and the unlicensed associations, it became a house divided within itself, though it did not fall. Since the reversal of the court decision and the abandonment of the licensed association, the National Association has regained much of its former strength, although it is not yet, as it once was, the sole representative of the trade.

Relations of N. A. A. M. and A. L. A. M.

Another body, known as the Automobile Board of Trade, has been formed, and much of the work of the two organizations now existing is duplication. It is hoped that the two can be consolidated, as there is much sentiment in that direction at present.

"No matter whether this can be accomplished or not," said Mr. Miles, **"the removal of the barrier between the two classes of members and the return of the National Association to power was the signal for results which plainly show the inevitable consequences of co-operation.**

"Our freight department backed by the members and the influence of a united industry became a real power and its value increased tenfold. Our commercial vehicle committee became so active that its work is among the most important we have done. Our show committee jumped into the breach and headed off threatened opposition in New York. The membership committee has added nineteen members to the roll, so that we have now 105 upon the list, by far the greatest number in our history. **Our work became once more aggressive and creative. We have done more good in the last 18 months than in the 7 years preceding."**

Mr. Miles touched upon the work of the good roads committee and on the association's co-operation with the A. A. A., the most notable result of which has been the securing of the appointment of a joint committee in Congress to take up the policy of the federal aid to the good roads movement. The association has been instrumental in the prevention of the passage of freak and discriminatory laws against automobilists and in the enactment of sane registration statutes.

The general manager further reviewed the work of the traffic department, the co-operation with the Manufacturers' Contest Association, the adoption of standard warranties, truck standardization activities and show work. He closed by saying, "The association, like the trade it represents, is stronger, richer and better than ever before; hence we have reason to believe that we shall continue to be more useful with every new year of our existence."

The general transactions of the convention resolve themselves into six principal divisions, namely: general business, traffic considerations, commercial vehicle work, yearly model discussion, selling problems and manufacturing. These divisions will be taken up in the order named.

Much of the business of the executive committee was of a general nature. Three were admitted to membership, swelling the total to 105. These were August Becker, Lippard-Stewart Motor Car Company, Buffalo; F. D. Waggoner, General Vehicle Company, Long Island City, N. Y.; and H. S. Miller, Lauth-Juergens Motor Car Company, Freemont, O.

The association will conduct a local show at Pittsburgh to fill a vacancy on the local show circuit caused by the inability of the two local organizations there to agree upon an exhibition in which the united trade may take part. The association is also in communication with the director of exhibits at the Panama-Pacific Exhibition and contemplates the taking over of and the allotment of the space which will be devoted there to the display of automobiles.

The commercial vehicle committee returned a resolution to the executive committee opposing an open-air motor truck show, it having been suggested that such an exhibition be held in the summer or fall of 1913, either as an experiment supplemental to the regular mid-winter show or to take the place of the latter after this winter. It was argued that such a show would give opportunity for the display of trucks in operation and of loading and unloading devices, but the predominance of opinion was that there are enough shows already, and that to introduce a big exhibition between April and December would tend to prolong the show season throughout the year, with its attendant disorganization of the factory forces.

Because of the cancellation of an agreement which formerly existed between the Manufacturers' Contest Association and the American Automobile Association as regards the running of contests, the National Association signified its willingness to appoint a committee to co-operate with the contest board of latter. Up to the time of the formation of the M. C. A. the National Association took an active part in the control of contests, and this is practically a step in the reverse to that policy.

In view of the soaring price of gasoline, the advisability of taking steps toward bringing about legislation to remove the ban upon the wholesale manufacture of wood alcohol for fuel purposes was discussed. It is stated that this fuel could be manufactured and profitably marketed at 10 cents a gallon, and many car makers and dealers feel that the association should act to relieve the ban which was placed upon the promiscuous manufacture of wood alcohol at the last session of Congress.

Although little is heard of the National Association in connection with good roads work, nevertheless its influential activities along this line have brought about many improvements in our national highways. The association has a good roads committee of which R. D. Chapin is chairman.

Mr. Chapin, in treating the subject of good roads, said in part:

"Some 8 years ago the association first interested itself in good roads work. It appealed to your executive committee, even then, that eventually touring was to become much more common in this country than abroad, where the finest of roads obtain. We knew that good roads were bound to come here, but our aim has been to hasten their construction, to help shape the legislation, both state and national, bearing upon highways, and to study the best types of roads for motor car travel.

Automobile a Road-Building Factor

"As each of you well know from your experience, our ideas have changed greatly in the past decade. The use of the roads by the tremendous number of motor cars that we all have produced has revolutionized the art of road building. It has given a great impetus to the making of permanent and continuous arteries of traffic. This very construction has in turn stimulated to a great extent the use of our product. **It has always been my opinion that the future expansion of our industry is in a great measure proportionate to the improvements in the roads of every state. We have each found that where the highways were good, automobiles were used in large and increasing numbers.**

"Two years ago your committee became convinced that from then forward the automobile user was perhaps the strongest factor, outside of the farmer, in the securing of good roads legislation. We therefore, in conjunction with the American Automobile Association, organized a Good Roads Board, composed of R. P. Hooper, president of the A. A. A.; A. G. Batchelder, chairman of the Executive Committee; G. C. Diehl, chairman of the Good Roads Committee; S. D. Waldon, representing the Automobile Board of Trade; C. J. Butler, representing the Motor and Accessory Manufacturers Association, and myself, representing the association. Our purpose was to co-ordinate the good roads work of the manufacturers and the users, bringing to bear the enormous influence of the organized body of users.

"Through the initiative of the National Good Roads Board the first Federal Aid Convention ever held in this country took place in Washington in January last. It was a notable gathering, country-wide in the complexion of its attendance, and including men who are leaders in the movement in their respective states.

"The concrete results of the convention was a resolution adopted by Congress, providing for a joint committee of House and Senate to take up the Federal Aid question in its

entirety, and to evolve a concise proposition. This joint committee now consists of five members each from the Committees on Post Offices and Post Roads of the two branches of Congress. With this committee we shall have much to do from this time on.

"Briefly summarized, the plan is for a comprehensive system of national roads to supplement well organized state systems, which shall include inter-county, market and township roads, with adequate provision for upkeep and a gradually improved form of construction.

"It is the belief of your committee that until we secure the construction of highways that will be permanent in the character of their roadbed, all roads will be much more expensive to maintain than should be the case. **We therefore say frankly that in favoring all highway construction, we hope the time is not far distant when the main arteries at least will be of some permanent construction that will need practically no attention for years after being laid. The government can do more to bring about a universal permanent highway construction throughout the country than any other agency. Hence, another reason for our campaign for national highways and Federal Aid.**

"National, state, county or township highways which bear the brunt of transportation, according to their particular uses, should be the ones first to receive consideration. Main township roads would have first call on the town; in like manner the principal county roads should first be built; the same idea holds good in selecting the roads of a state, and finally, those highways which serve in a national or inter-state manner, demand the Federal Government's primary recognition.

"Summarizing our efforts, let me say that we are endeavoring, through the user, to create highway departments in states that have none; to let the motor car owner pay his just proportion of taxes, these taxes to go into the respective highway funds; to secure federal aid and federal supervision of the inter-state roads, and to hasten as much as we can highway construction in every county in the United States."

The standard warranty which has been adopted by the National Association for both pleasure cars and commercials has been quite generally used by the members of the organization, but not unanimously. In this connection, S. A. Miles said: **"That the standard warranty is sound has been demonstrated by the fact that we have never heard of a case in which a manufacturer or a dealer suffered serious loss through its use."**

Freight Service Discussed

To urge its unanimous adoption, A. L. Pope, of the Pope Manufacturing Company, Hartford, Conn., prepared a paper entitled, "Why all Manufacturers Should Use the Standard Warranty." This was read by L. H. Kittridge, of the Peerless Motor Car Company, Cleveland. **Although advocating the use of the warranty, the paper took the stand that the car maker should not refer so much to the warranty which his product carries as to the service which he can give should anything happen to it. He should not expound so loudly that he will give free repairs, but he should so build his machines that there will be no repairs needed whether free or not.**

Ever since the organization of the Traffic Department of the National Association in 1908—4.5 years ago—no event in the movement of automobiles has escaped its attention. Through the efforts of this department most satisfactory results have been obtained in assisting manufacturers, and hence, indirectly dealers and car owners, to move their cars to their destinations.

One of the most important matters considered was that of freight car service, and to cope with this during the coming winter the N. A. A. M. has decided to instal a branch traffic department in the city of Detroit which will be opened by J. S. Marvin, who is head of this department of the association work, at the earliest moment. **The work of this department from the Detroit office will cover probably from Buffalo east and will consist in following every freight car filled with automobiles from the time they leave the various factories in this territory until they reach their destinations, when every effort will be made to get them hurriedly unloaded and immediately returned to the factory. By such a follow-up plan it is hoped that all available cars for automobile railroad shipment will be used to the fullest capacity.**

It developed in the discussion between the automobile manufacturers and the freight representatives of the various railroads who attended the conference at the request of the manufacturers, that the shortage of cars was often due to carlessness on the part of teh automobile manufacturer as well as neglect on the part of the railroads. **It developed that automobile manufacturers not infrequently get freight cars delivered to their factory shipping platforms and hold them 3 or 4 days and perhaps longer before making a shipment.** The railroad companies in Detroit by investigation discovered this abuse. Loss of time in this way is equally as disastrous as delays on the part of the railroad company holding the empty cars at the point of delivery after the dealer has taken the vehicles out of them.

Marvin Talks on Transportation

But the railroad freight representatives announced that their respective roads are doing much to relieve the situation by new cars, some of the companies having recently placed orders for as many as 500 new ones.

The railroad representatives who were present at the conference were A. B. Atwater, assistant to the president, Grand Trunk Railway System and General Manager of the lines in the United States; E. B. Boyd, assistant vice-president, Missouri Pacific Railroad and the Soo lines; G. C. Conn, vice-president and traffic manager, Pere Marquette Railroad Company; J. S. Bartle, assistant traffic manager, Atchison, Topeka and Santa Fe Railroad Company; Nat Duke, assistant traffic manager, Delaware, Lackawanna and Western Railroad Company; and W. C. Rowley, general freight agent, Michigan Central Railroad Company.

In speaking on the subject of traffic as it applies to the National Association, Mr. Marvin outlined the workings of the traffic departments of the large industrial concerns as a comparison. **He placed the amount of freight earned by the railroads of the country on shipments of automobiles from all factories at not less than $6,000,000 per year and explained how this expenditure should be supervised.**

"The question of service," said Mr. Marvin, "is of vital importance to the industry. When the railroads fail to operate on accustomed schedules or when they are unable to keep pace with the manufacturer of any article within reasonable limits in the supply of freight cars, the situation is about as serious as could be imagined. The conversion of finished goods into cash is interrupted.

"When industries in general find it difficult to secure sufficient freight cars, the situation is rendered all the more difficult for the automobile factories, for when a car shortage occurs, shippers of other articles gain the use to a large extent of the automobile cars.

"Such a car shortage exists in this country today; the railroads are right now taxed to the limits of their resources in handling the exceptionally large crops and a heavy movement of traffic of all kinds. The return of freight cars to the home roads is difficult of enforcement, and when it is considered that the observance of this rule is all that the automobile industry has to depend upon for the shipment of its goods, the real aspect of the situation confronting us is apparent. To shippers of other articles which can be loaded in ordinary box cars it does not matter so much if the cars they load are owned by the railroad furnishing them, but the automobile shipper hasn't this choice and must in the main depend upon the outlying railroads returning the initial lines' automobile cars."

The subject of Yearly Models was brought up for discussion, the principal speaker on the topic being H. O. Smith, Premier Motor Manunfacturing Company, Indianapolis, Ind.

Mr. Smith's address was entitled Yearly Models and in it he took a firm stand against such and attributed many of the present ills of the industry to annual models. He characterized the annual series or models as a barnacle which has fastened itself upon the industry.

Among the various injuries worked by the annual model

is that of factory expense in that each annual model, incorporating changes means the abandoning of jigs, tools and other equipment. There is also a factory loss in production because the workmen in the factory who have grown familiar with the production of the previous model produce at a lower capacity during the time required to familiarize themselves with the new job.

I am not sure that any particular changes made from year to year makes new buyers, an exception, however, being the addition of such an accessory as self-starters. **How many of the 990,000 automobile owners in the United States to-day purchase their first car because it was one of the latest models?**

One of the ills of the annual model is the early announcement, an example being a concern announcing in April, 1912, its 1913 model, this announcement being made before some of the Iowa dealers had a chance to even demonstrate their 1912 models to the buyers. These are the announcements that merely serve as signals to the buying public to stop buying 1912 models and wait until the full complement of 1913 models have been announced.

Yearly models cause unrest in factories. There is always a hurry. A hurry to complete the last of the old models; a hurry in the true room to get the jigs and tools ready for the new models, and other hurries.

The annual models can be charged with the second-hand car evil which has loaded itself on the industry.

Mr. Smith concluded his paper by presenting the fact that the new annual models or series do not actually create new business.

Following this paper one of the most heated discussions of the entire conference took place. The makers ranged themselves on both sides. Those who talked in favor of the annual model advanced the argument of style as a selling factor, whereas those opposed to the annual model centered their arguments around service rather than style.

The Multiplicity of Models

To the manufacturing branch of the automobile industry the address by G. W. Bennett, Willys-Overland Company, Toledo, Ohio, on the multiplicity of models belongs. Mr. Bennett advocated the concentration upon a small number of models, since the marked successes of the automobile industry will in the future lie in specializing, each plant making that which best fits its demands, and producing that model in the quantities to which its place in the automobile market entitles it.

To make several models in a factory which is equipped to make not more than one satisfactorily necessarily restricts the output of that plant and divides the energies of its engineers, its operative force and its selling force into several small channels, all of them considerably below par in efficiency because of such division.

The growth of the industry shows that the most prominent manufacturers have realized this and are catering to the class of demand which they can best supply. I believe that this development will become more marked, and that in a very few years each factory will limit its product to one model with perhaps several styles of bodies interchangeable on the chassis.

It may not always be possible for one manufacturer to profitably restrict himself to one chassis, but it will be possible, if more than one is considered necessary, to make a large number of the parts interchangeable, and only in this event would the production of two models be warranted or likely to be successful.

Furthermore, the subject of subsequent service is involved so much that where more than one model is built adequate service to the user is difficult and consequently seldom satisfactory, and without that satisfaction complete success is impossible.

Mr. Bennett pointed out that since the interests of the dealer are identical with those of the manufacturer, concentration of the manufacturer on a single model allows the dealer to focus his atention to this same single type, with his consequent better acqaintance with it and the methods necessary to sell it.

He said that it would be expecting too much to hope that the industry would be able to arrange production so that every company will prosper, but he stated that the association was in better shape to accomplish such a result than any other agency.

Two Papers on Selling

Chalmers and Benson Consider Problems of Marketing Cars

Extracts from Addresses Read Before the National Association of Automobile Manufacturers

ON automobile selling, the manufacturers heard two able papers, one by Hugh Chalmers, Chalmers Motor Company, Detroit, who attacked the selling problem with which the car maker of today is confronted, and the other by E. R. Benson, Studebaker Corporation, Detroit, on territory and discounts.

Our selling problem, said Mr. Chalmers, may be roughly divided into two classes—first, those the solution of which can best be accomplished by the manufacturers as a whole working together; second, those in the solution of which each company must go its own way and find its own best methods. It is the first class, very naturally, that we should consider here.

We are led to the first problem worth our while to consider by the question What is selling? What constitutes a sale?

It seems to me that selling—selling a motor car, for instance—is something more than simply exchanging an automobile for a check or for so much cash. This may be merely a friendly transaction; or an exchange, fair or unfair, or perhaps a bit of charity or philanthropy. Selling, real selling, is the disposal of goods at a profit. Anybody can give goods away, but selling things at a profit is a job for good salesmen and good business men. Let us keep this point in mind.

Now, gentlemen, business exists for the net. It is a nice enough thing for those who like it to build up a great volume of gross business merely for the sake of talking about it, but the final test of success is in the net figures. The prime object for which we are all working, therefore, is to make money.

It seems to me that automobile dealers are of more vital importance to both the manufacturer and the buyer than is the dealer in nearly any other line of business. **The right sort of automobile dealer is harder to get than a good dealer in other lines**—that is why he is so vital to the manufacturer.

And, again, an automobile dealer is needed more by the buyer after the purchase than is the dealer in any other line—that is the public's vital interest. Both the manufacturer and buyer, therefore, are anxious to have a good dealer and to have him remain so. **A good dealer won't remain good very long unless he can make some money; unless his business will show a net profit. Either he will get out of the business, or he will simply drift along for a time, only to fail entirely in the end.**

Mr. Chalmers pointed out how over-production affects sales, how second-hand cars, weather, good roads and honest advertising have a good or bad influence.

Inasmuch as the apportionment of territory and the discount to be allowed the agents are much mooted questions, Mr. Benson's talk was very timely.

Territory, in one sense, he said, is the capital of the sales manager, inasmuch as out of it he has to obtain his results. The subject of territory, therefore, commands the deepest study and research; it demands that we should all have ready the best sources of information and the latest data to draw from; that we should have on hand statistics on population and wealth, late reports on manufacturing and other industries, reports on crops, on mercantile conditions, on the status of the markets of the country, as well as continual reports from our own traveling representatives, analyzing conditions from their points of view.

Mr. Benson believes that the discounts and divisions of territory, no matter to which class given, should all be controlled, systematized and agreed to by the manufacturer in order to insure his procuring the most out of the territory. He took up the consideration of the bonus or rebate plan and the system of graduated discounts by which the dealer commences at one rate and gets a greater discount in proportion to the amount of business he does.

Truck Committee Report

Revised Body Weight Allowance Scale Is Submitted

Scale of Demonstration Charges for Commercial Vehicles Lowered—Warranty Work Progressing

MR. WALDON presented reports of the work of the Commercial Vehicle Committee since the June 4 convention of the National Association and of the business transacted at the meeting of this committee November 6. As a result of its deliberations the association revised the scale of mimimum body weight allowances based on stake types, as adopted at the March meeting of the association. The revised schedule representing approximate averages of weight of all types of bodies commonly fitted to chassis of the different capacities follows:

Load Capacity, Pounds	New Body Weight Allowance, Pounds	Former Body Weight Allowance, Pounds
1000	600	500
1500	750	...
2000	900	600
2500	1000	...
3000	1050	700
4000	1200	800
5000	1350	900
6000	1500	1000
7000	1600	1100
8000	1700	1200
9000	1750	1300
10000	1800	1400
12000	1900	1600
14000	2000	1800
16000	2100	2000
18000	2200	2200
20000	2300	2400

The scale of demonstration charges for commercial vehicles which was adopted at the June meeting of the National Association was lowered. This was done because it was deemed desirable that the charges should bear a close relation to the actual normal cost of operation of the vehicles and that the rate per ton-mile of work done should decrease as the capacity of the unit increased. The new schedule is given:

Truck Capacity Tons	Approximate Average Cost Per Day	New Scale of Demonstration Charges Per Day	Former Scale of Demonstration Charges Per Day
½	.....	$10.00	$10.00
1	$8.50	10.00	10.00
1½	9.50	11.50	.....
2	10.50	13.00	15.00
2½	11.50	14.00	.....
3	12.25	15.00	20.00
3½	13.00	16.00	.....
4	14.00	17.00	25.00
4½	15.00	18.00	.....
5	15.50	19.00	30.00
6	16.50	20.50	30.00
7	17.25	22.00	35.00
8	17.75	23.00	35.00
9	18.25	24.00	40.00
10	18.50	25.00	40.00

Efforts made to ascertain the extent to which the standard truck warranty recommended by the National Association has been adopted by manufacturers have brought forth replies from sixty-four makers. Sixteen members and eighteen non-members have reported their definite adoption of the warranty and their intention to incorporate it in their new catalogs when issued. Nine other member companies and one non-member are in favor of the standard warranty and report that when they are manufacturing commercial cars on a sufficiently large scale to require a truck warranty they will probably adopt this one. Seven non-members favor the warranty and say they will adopt it if a majority of the makers do so. Three members and one non-member report that they have the question under consideration. **Opposition to it was found in only nine cases.**

With a view to rendering truck bodies more readily interchangeable between different makes of trucks of the same capacity rating, and to enable the body builder to make up stock bodies that can be mounted on any make of chassis on demand, the committee collected a large amount of data from truck manufacturers and from an analysis of this data recommended two standard frame widths which were adopted by the association.

These frame widths are 36 and 42 inches and frame lengths, also adopted, for distances back of the seat, are in multiples of 1-2 foot from 48 inches for the lightest package delivery car to 216 inches for the largest sizes of trucks. The committee's idea in making frames in multiples of the foot and 1-2 foot lengths is so that the number of frame lengths in common use on trucks of 1, 1 1-2, 2, 3 and 5-ton trucks can be reduced to fifteen sizes to meet all ordinary requirements even with short, medium and long wheelbases in each capacity. These would be made in 1-2-foot lengths from 8 feet to 15 feet. However, ten sizes from 9 to 14 feet will take care of all ordinary requirements.

These frame lengths can be made up to fit the two widths of frames—36 and 42 inches—and in any of the standard types of bodies desired. If these recommendations are adhered to by a majority of the truck manufacturers it will make the problem of supplying bodies much simpler for the maker of this part of the completed vehicl.

Three Papers on Truck Subjects Read

In addition to the report of the work of the Commercial Vehicle Committee since the last convention of the association in June, three papers dealing with truck and business vehicle subjects were presented during the course of the Detroit convention.

S. D. Waldon, Packard Motor Car Company, considered the relative business in pleasure cars and trucks:

On every side we hear the prediction that the motor truck business will be the big end of the motor car industry in a few years, said Mr. Waldon. We get it from newspapers; we get it from bankers, and automobile manufacturers believe it themselves. Undoubtedly many automobile manufacturers and their agents, too, have begun to look upon the truck as the vehicle which is going to carry the financial load of the pleasure car business.

Now, it is well worth while at this time to inquire carefully what justification there is for this prevalent conviction. Is the growth in the volume of the truck business not vastly overestimated, and has it not already been more than fully anticipated and discounted by manufacturing preparations?

A somewhat startling answer to these questions is found by a simple comparison of the present relation of the volume of truck business to passenger car business in the United States and the number of factories engaged in each branch of manufacture.

Carefully compiled statistics, which are very conservative, show that 652,000 passenger cars were registered in the various states last year. The same compilation shows that 25,500 commercial vehicles were registered in the same year. **On this basis there was one truck to twenty-six pleasure cars.**

The total estimated value of the passenger cars was, in round numbers, $812,000,000 and the total valuation of the trucks was $56,000,000. This makes the proportion of passenger car value to truck value last year approximately 15½ to 1.

Investigation shows the astonishing fact that there are about an equal number of factories in the country producing passenger cars and commercial cars. The numbers are variously estimated according to the ideas of different enumerators as to what constitutes an active manufacturing concern.

Probably as good a criterion as any is the number of makers who exhibited their products in each line at last winter's automobile shows at New York and Chicago. There were 111 different manufacturers of pleasure cars in the Garden, Palace and Coliseum shows and 101 exhibitors of commercial cars.

Thus we find that there are nearly as many companies competing for $56,000,000 worth of truck business as there are companies dividing among themselves the bulk of the $812,000,000 worth of passenger car trade. On an average the truck manufacturers had done a total business of about $560,000 apiece up to the beginning of this year and the passenger car makers a business of about $7,320,000 apiece.

State registrations for the first two months of 1912 showed

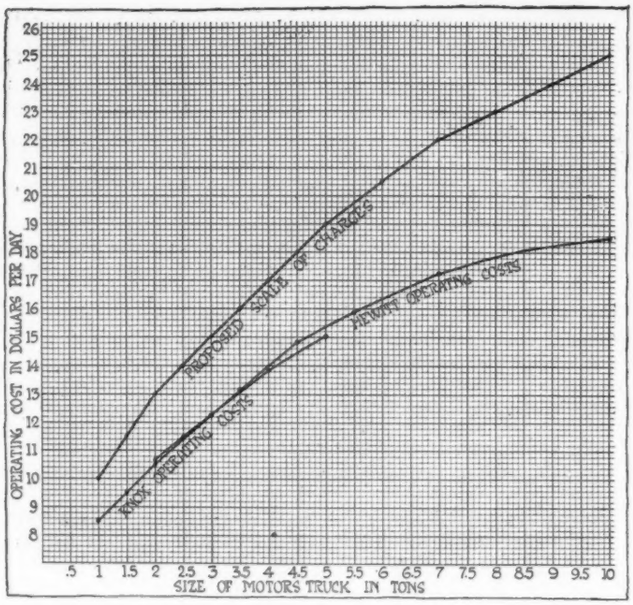


Chart illustrating average actual motor truck operating costs per day and scale of demonstration charges based on them as proposed by the N. A. A. M.

17,126 commercial cars registered, as compared with 342,439 passenger cars, or slightly less than 1 to 20.

There is no desire on my part to belittle the motor truck business, but in giving my personal attention to the work of the Commercial Vehicle Committee of the National Association some of these facts have come home to me with particular force, and it seems that a considerable number of persons have been carried away with enthusiasm over motor truck prospects and embarked in their manufacture without making any study of existing conditions and calculating the prospects of the future.

The cost of manufacturing and selling trucks is considerably higher proportionately to the volume of business done than the cost of manufacturing and selling passenger cars.

In connection with the consideration of truck matters, an address was delivered by M. L. Pulcher, Federal Motor Truck Company, Detroit, on the subject of the injudicious truck selling methods and their effect.

The necessity for disposing of product in order to realize on it and devote the money to payment of accounts and the continuance of manufacture, said Mr. Pulcher, is the root of numerous evils in the selling end of the business. There are two principal kinds, one originating with the factory and the other with the sales force.

The executives at the factory probably believe that theirs is the best truck built of its rated capacity and price, and they cannot see why the salesman should have any difficulty in selling it; consequently they press the sales force.

The first result of such factory policies is to realize the object—quick sales. If there were no other and adverse results such would become common practice, but the fact is they are going out of favor both with the truck manufacturer and the public.

The selling of trucks is not very different from the selling of other machinery, and it should be done on the same sound basis.

Mr. Pulcher took up the methods of sales from the salesman's end, discussing the fallacies of price-cutting and the various ways of arriving at charges for demonstration. The common fault of knocking the other fellow's product in order to make sales was discouraged.

David Beecroft, editor of THE AUTOMOBILE, discussed a subject of vital interest to motor truck manufacturers, in that he showed a situation with which the commercial vehicle manufacturer must cope and must remedy in order to make his product show up to its best advantage. Mr. Beecroft's subject was Transportation Delays at Railroad and Dock and City Terminals.

Of 287 motor truck and horse wagons checked at railway and steamboat terminals in the cities of New York, Chicago and Detroit it was discovered that these vehicles had an average delay of 11.3 minutes from the time they reached the proximity of the freight terminals until they reached the unloading platform and were ready to begin unloading or loading operations.

Figures taken of the length of time required for these 287 vehicles to unload or load showed an average of 27.3 minutes each, so that, roughly speaking, each vehicle waited almost half as long to get to the loading or unloading platform as it required to perform the loading or unloading. This loss of time cuts down the efficiency of the motor truck as well as that of the horse vehicle.

Of the three cities, New York, Chicago and Detroit, the last showed the least delay. Of forty-two vehicles checked in the city of Detroit the average delay at one railway freight terminal was 3 minutes and at another 4.4 minutes. This difference in time was due to narrower approaches at one than the other. Chicago averages better than New York in the reduction of time lost at terminal depots. **Of three leading Chicago freight terminals in investigations extending over three successive days, the average delay at one depot was 6.2 minutes per vehicle, at another 11.7 minutes, and at the third the amazing figure of 25 minutes.** In contrast with this are the figures taken from three New York City dock terminals based on observations extending over a similar period. In one the average delay was 9 minutes, at a second 10, and at a third 15.5. While these averages do not appear abnormally high, they invariably represent a high ratio with the time required to unload. This is demonstrated at one Chicago depot where the average delay was 25 minutes and the average unloading time 24 minutes, so that each vehicle waited longer to get the chance to unload than was required in the unloading. At another Chicago depot the average delay was 11.72 minutes, and the average unloading time 23.74 minutes, giving a delay-unloading ratio of 1 to 2. In New York, at one of the docks the average delay was 10 minutes and the average unloading time 19 minutes, which is more than a 1 to 2 delay-unloading ratio.

But all of the loss of time or delays at freight terminals, whether in connection with railroads or steamboat docks, is not due to lack of capacity—lack of system is a big factor in many cases.

One of the greatest obstructions to the reduction of delays at present is the driver of horse vehicle. He is generally in sympathy with the delays and often actively assists in causing them. Recent observation showed traffic jams in the city of Chicago, where 155 to 175 vehicles, mostly horse trucks, and some motor trucks, were held for 1 hour and 20 minutes. The blockade was finally broken up by mutual consent of the drivers, and was accomplished in fewer than 5 minutes. Many horse drivers make it a point of reaching the railroad freight yards and spending from ½ to 1 hour sleeping. They often miss their turn at the unloading platform, but are not disappointed in that they have accustomed themselves to doing but three trips or to carrying three loads per day, which allows of wasting a great deal of time, and they calculate on doing this.

The whole horse vehicle driver situation is so unsatisfactory that the dealer in motor trucks will have to give it his most careful investigation or he will meet with disappointment.

John C. Wetmore went straight to the point in his talk at the N. A. A. M. meeting late Thursday afternoon, using as his subject, "Contests as an Aid to the Automobile Industry."

He stated it as his opinion that the manufacturers must provide contests to make the news to enable the newspapers of the country to continue the generous treatment now given news of the automobile industry and stated that unless the makers came forward more liberally with entries for contests they would soon find themselves barred practically from the news columns of the country.

Mr. Wetmore said that from one end of the country to the other there was a war to-day against the amount of space given to motoring and he advised that the N. A. A. M. recommend to the A. A. A. the reclassification of great racing events and segregation of great classics for every class of cars, giving it as the opinion of the newspaper men that greater good would be done the industry by having the great events of the year each a star event in one locality instead of grouping many great events as at present.

He advocated the formation of local promoting associations such as New York has formed to promote track races, road races, hill climbs, touring events, exhibitions, orphans' day outings, and so on, these events being promoted by a stock company composed of all dealers with 50 per cent. of the profits to a sinking fund to cover possible future losses.

Truck Demonstration Charge To Be Lower

National Association Figures on Reducing Cost to Prospective Purchasers, Especially in Large Vehicles

Compilations of Knox and Hewitt Companies Used as Basis for Recently Adopted Scale of Prices

TREATING demonstration charges based on operating costs, the National Association of Automobile Manufacturers has compiled the following article and tabulations:

Theoretically, the cost per ton of motor trucking should decrease as the size of the truck increases, and logically, any schedule of charges for demonstrating motor trucks should bear a definite relation to the actual cost of operation and maintenance. Such charges should also be so fixed that the cost of doing a given amount of work will be less with the power vehicle than with horses and wagons.

The most elaborate tables of truck operating costs are those issued by the Hewitt Motor Company and the Knox Automobile Company. They agree closely in the average per diem costs of motor trucks from 2 to 5 tons' capacity. These costs are shown in the appended table in columns two and three, together with a schedule, in column four of uniform approximate average costs for all truck sizes. The costs are also plotted in the lower curves of the accompanying chart.

The work done by each size of truck is shown in ton-miles in column six. The ton-mile capacity of a truck in a working day is assumed to be the tonnage rating of the vehicle (column one) multiplied by its speed in miles per hour (column five) times one-half the number of working hours, that is 5. The miles per hour are the N. A. A. M. standard speed ratings. Five hours is taken as the total daily running time, as in general trucking service about one-half of the 10-hour day is consumed in waiting for loading and unloading and other delays.

Dividing the daily cost of operation by the ton-miles of work performed gives the ton-mile cost in cents shown in column seven. It is noteworthy that the rate drops gradually from the 1-ton size to the 5-ton size, and then gradually increases to the 10-ton size.

As nearly as can be calculated from information at hand the cost of doing work with horses is as follows:

COST OF TRUCKING WITH HORSES

Tons	Team (horses)	Daily Rate	Miles Per Working Day	Ton Miles	Ton-Mile Rate (cents)
1	1	$5.50	16	16	34.37
2	1	6.50	16	32	20.31
4-5	2	8.50	12	48-60	17.70-14.16
8-10	4	17.50	12	96-120	16.35-14.58

According to this table, based on statements furnished by professional truckmen, it costs twice as much to do work with horses as with motor trucks, even allowing only 5 hours' running per day for the power vehicle. The horse figures show the average maximum day's work for animals, but if the waiting time of the motor truck is cut down one-half by quick-loading methods its work capacity is increased one-half and the ton-mile rate decreased proportionately.

If it is conceded that the charges for demonstrating motor trucks should be higher than the actual cost of operation, it is found that a schedule one-quarter higher gives the scale shown in the dotted line in the chart, ranging from $10.62 a day for a 1-ton truck to $23.12 a day for a 10-ton truck.

As this is an awkward scale of dollars and cents, the scale shown in the solid line, ranging from $10 a day for a 1-ton truck to $25 a day for a 10-ton truck, has been adopted by the N. A. A. M.

The new scale is materially lower than the system of rates that has been in effect generally, the chief reductions appearing in the charges made for the larger sizes of trucks. These amount to as much as $15 a day for 10-ton truck demonstrations and range from that figure to a saving of $1 or more on the smaller sizes.

Big Men as Truck Drivers

Automobile trucks have created a demand for a new type of chauffeur, according to the officials of the Automobile School of West Side Young Men's Christian Association, Eighth avenue and Fifty-seventh street. It is the heavy man, with well-developed muscles, who can drive and care for his car and also load and unload, that will find himself much in demand.

This fact is emphasized by the present enrollment at the automobile school, where a great many of the students are men who have been sent to the school by business concerns that are using motor trucks. Almost without exception, the companies have picked big, muscular men.

A. W. Robinson, sales manager of the truck department of the Locomobile Company of America, in a letter to Edward L. Wertheim, Educational Director of West Side Y. M. C. A., voices the same opinion. Mr. Robinson says:

"I do not think the average chauffeur for pleasure cars will make the proper driver for a truck. One of the difficulties is going to be in getting men who will be able to operate and take care of the mechanical feature of the truck and willing to load and unload. For these men, however, there is going to be a big demand.

"We would be glad to have your opinion on this matter."

Inquiries were made by Mr. Wertheim to ascertain the average wages paid to motor truck drivers. Investigation showed the following average of wages:

Drivers of 1-ton trucks $18 per week.

Drivers of 3-ton trucks $21 and $22 per week.

Drivers of 5 to 7-ton trucks $25 per week.

The employment department at West Side Y. M. C. A. also shows this tendency for big and muscular men to drive trucks. Many business houses secure their employees through the Y. M. C. A. employment bureau.

"Send us a driver for motor truck, but he must be a big man," is the tenor of many letters received.

Tabulation Showing Operating Costs in Real Experience Compared With the New Scale

1 Truck Capacity (tons)	2 Average Operating Cost Per Day (Hewitt)	3 Average Operating Cost Per Day (Knox)	4 Approximate Average Cost (per day)	5 N. A. A. M. Speed Rating (MPH)	6 Ton-Miles Per Day, 5 Hours' running	7 Rate Per Ton-Mile (cents)	8 Scale of 125% of Operating Cost (per day)	9 Rate Per Ton-Mile (cents)
½				16	40		$10.00	25.00
1	$8.58		$8.50	15	75	11.33	10.00	13.33
1½	9.50		9.50	14	105	9.04	11.50	10.95
2	10.53	$10.60	10.50	13	130	8.07	13.00	10.00
2½	11.48		11.50	12	150	7.66	14.00	9.33
3		12.20	12.25	11	165	7.42	15.00	9.09
3½	13.18		13.00	10½	183¾	7.07	16.00	8.70
4		13.80	14.00	10	200	7.00	17.00	8.50
4½	14.84		15.00	9½	213¾	7.01	18.00	8.30
5		15.00	15.50	9	225	6.88	19.00	8.40
6			16.50	8	240	6.87	20.50	8.54
7	17.2[illegible]		17.25	7	245	7.04	22.00	8.97
8			17.75	6	240	7.39	23.00	9.58
9			18.25	5½	247½	7.33	24.00	9.69
10	18.50		18.50	5	250	7.40	25.00	10.00

British Designers Aim at Increased Motor Efficiency

(*Continued from page* 1039)

ticularly well adapted to thermo-syphon cooling, the water pipe connections being of the simplest nature. In the case of the six-cylinder engine the cylinders are cast in two blocks of three cylinders each. As regards the valves, these are arranged on one side of the engine, giving an L-type combustion chamber, this type being held by most British makers to be the most satisfactory. The valve tappets and springs are inclosed by readily detachable doors. For the purpose of valve construction a special steel is employed having a high percentage of nickel and thus offering great resistance to over-heating and pitting. The inlet and exhaust valves are interchangeable. The crankcase of the four-cylinder engine have five bearings and the bushings in which the crankshaft journals run are white metal. The bolts which hold the bearings in place pass through the top of the crankcase so that the metal of the crankcase is held in compression instead of in tension. The lower part of the crankcase forms an oil sump only.

Another interesting feature is connected with the cooling, which is termed assisted thermo-syphon. With this arrangement the fan spindle is supported by the water inlet pipe, and the spindle of the fan is extended to the waterjacket carrying at its inner end a propeller, which, while it assists in driving the circulating water, provides sufficient clearance not to impede the circulation should the fan belt become detached.

The crankshaft, which has five bearings in the case of the four-cylinder engine, has seven in the case of the six-cylinder engine; it is constructed of the highest quality nickel chrome steel, oil hardened. The crankshaft, as well as the camshaft, bearings may be inspected by the removal of a pair of aluminum doors on the side of the crankcase.

Ignition is performed by a high-tension magneto. The armature is driven by a dog-coupling mounted on a shaft extending from the timing-gear casing, the design of which permits the fitting of independent dual ignition to the 20-horsepower car when required. The firing point is, of course, variable from the steering wheel.

The control of the engine is effected by a throttle lever and a magneto advance lever, both fitted above the steering wheel, in combination with a pedal accelerator.

For 1913 the following Napier motors will be constructed:

Horsepower	No. of Cylinders	Bore and Stroke
59.9	6	127 x 127
45	6	102 x 127
30	6	82 x 127
15	4	82 x 127

The engine has a bore of 82 millimeters by a stroke of 127.

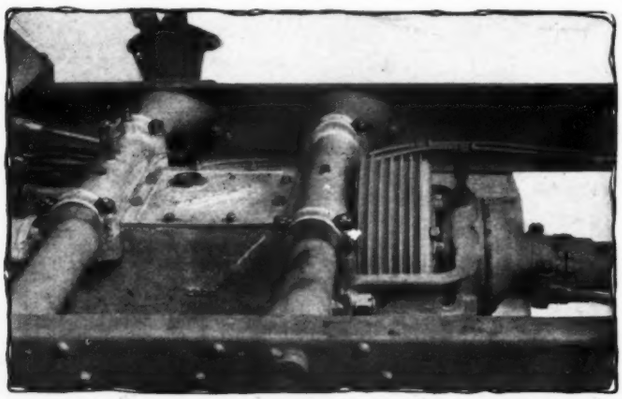


Fig. 11—Crossley gearbox attachment on the 1913 20-horsepower chassis

The Bosch high-tension magneto of the single order is retained, with variable control. Considerable attention has been paid to the lubrication, which is of the entirely forced-feed type. A rotary oil pump delivers oil to the bearings under pressure with a valve arrangement adjusted to regulate the amount of oil according to the speed of the engine, a relief valve being provided which prevents the oil rising above the maximum. This is obtained by a spring-loaded valve which returns any excess of oil to the sump. The oil-circulating pipes are outside of the base chamber, so that they are easily detached for cleaning, although every precaution is taken to filter the oil by means of gauze filters in the oil filling inlet, and in the chamber between the pump and the outlet pipes.

The carbureter is of the two-jet type, with rotating throttle valve and adjustable air shutter. It is fed gasoline under pressure, a small air pump being worked from the engine camshaft. As an instance of the care given to minute details, the air inlet of the pump is covered by very fine gauze to prevent the suction of any dust.

Another feature is that the exhaust pipe is carried down the front end of the engine, which prevents heat getting to the front seats, a particular advantage where the scuttle dash is employed. Fig. 1, showing the side view of the Napier chassis, clearly indicates the general arrangement of the whole.

With regard to the 15-horsepower model, the bore and stroke of the engine are 82 by 127 millimeters, with cylinders cast in pairs. The engine and gearbox are built up as a unit. It will be noticed that the flywheel is at the front end, and another feature is that the base chamber of the engine is not open to the gearbox or the clutch. Each of these component parts has its own oil chamber, the reason being that oil which was suitable for the engine was not satisfactory for the clutch, which is of the multiple-disk type. A cock is attached for the purpose of indicating by means of a rod the level of oil in the clutch chamber. When filled up to the necessary level, oil flows out of the cock, and denotes that the requisite lubrication is provided.

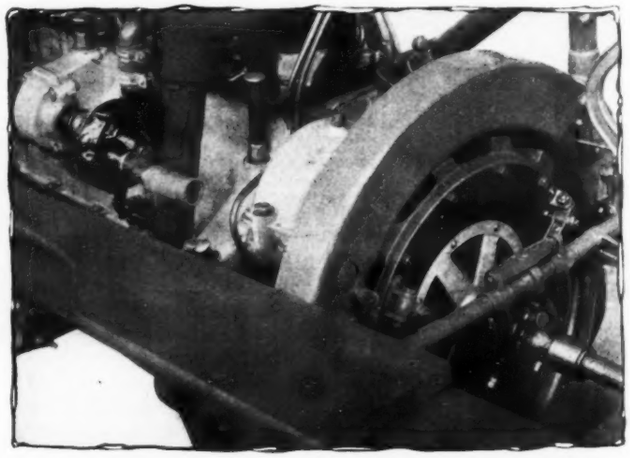


Fig. 12—View of the clutch and rear suspension of the Deasy motor

Spur gears are used for driving the camshaft and spiral for the magneto, which is of the single Bosch type. Cooling is on the thermo-syphon principle, and it will be noticed that there is an extra outlet immediately above the exhaust valves between the spark-plugs.

The Argyll program for 1913 comprises four types, that is, a 12-horsepower four-cylinder poppet valve engine henceforward to be called a 12-18 horsepower; a 15-horsepower model for colonial purposes fitted with a poppet valve engine; a 15-30 horsepower and a 25-50-horsepower sleeve valve model.

The 12-18-horsepower engine has the same bore and stroke dimensions, that is: 72 millimeters by 120 millimeters, but the exhaust and inlet valves are of larger diameter and, consequently, more power is developed.

The 15-horsepower is similar in most respects to the 12-horsepower, but it has 80 millimeter by 120 millimeter cylinders cast in pairs. Thermo-syphon cooling in conjunction with an efficient ball-bearing fan insures proper cooling.

Briefly, there is in the Argyll engine, Fig. 17, a single sleeve, and this sleeve has a combination movement produced by an oscillation and a reciprocation, thus any point upon the sleeve describes an ellipse upon the cylinder wall. The sleeve has five ports in its upper end and the cylinder has six ports. Three of these ports are for the inlet of the gases and three for the exhaust; meanwhile the central port in the sleeves serves alternately as an exhaust and an inlet port. The exact shape and size of these ports has been decided after considerable experiment.

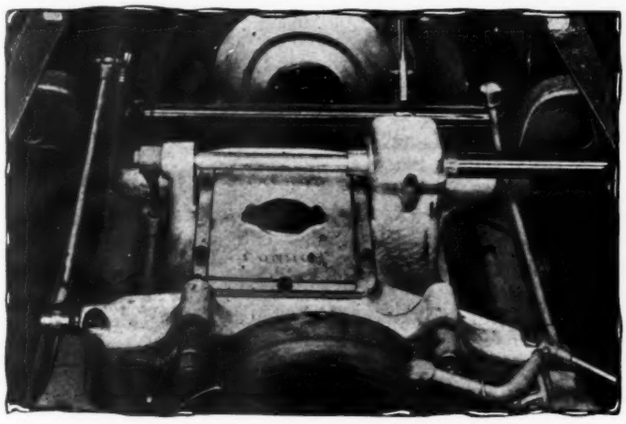


Fig. 13—Talbot gear box and brake mounting with long spiral backspring

The crankshaft has three bearings, the journal diameter being 45 millimeters. The bearings from the front end have lengths respectively of 82 millimeters, 64 millimeters and 80 milllimeters, while the crankpins have the same diameter as the shaft and a length of 50 millimeters. The short crankwebs have a width of 54 millimeters and a depth of 24 millimeters, and the center webs have the same width and a depth of 40 millimeters. Thus, there is very little chance of whip. The crankshaft has at its flywheel end an oil throw collar of 64 millimeters diameter and at the forward end a double V collar to act as an oil throw. The pistons have a length of 102 millimeters and are provided with three rings. The small ends of the connecting-rods are well drilled to provide lubrication, and rather substantial bushes are fitted. The sleeve driving shaft has a diameter of 32 millimeters and 50 millimeters. A silent chain, 1.5 inches wide, is employed to revolve the shaft. Outside the chain pinion and close up against it is a ball journal bearing to take the pull of the chain, and at the rear end of the shaft a double ball thrust is provided to take up the end-thrust of the spiral gears.

There is one small alteration that has been made in the sleeve-driving mechanism. A small hole has been drilled through the wall of the plunger into the interior so as to break any small vacuum that might otherwise be caused.

The oil pump has gears of about 25-millimeter pitch diameter and a tooth width of 12 millimeters. The port which supplies the pump with oil is a long drilled hole at the bottom of which is a small ball valve contained in a removable seating and one would expect that the fact that the pump has to draw its supply of oil from a point some 10 inches beneath it might lead to trouble. The oil pump is held up in place onto a conical seating by four studs bearing upon a square flange so that the pump is readily removable. There is a chamber on the side of the crankcase containing a float and needle indicator for ascertaining the oil level, and the top of the needle passes through a small fitting having a spring lid which normally holds the needle down. Lifting the lid makes the needle free to slide. The under side of the crankcase has longitudinal ribs to assist in carrying away

Fig. 14—Three gearshafts and gears in Crossley change-speed set

the heat of the oil used for lubrication as shown in Fig. 17.

There is another piece of detail work in connection with the spiral gear. Immediately above the oil pump can be seen the main oil way and there passes through this opposite to each spiral gear a drilled set-screw. In this manner a stream of lubricant is continually thrown upon each of the four gears so that there is not much possibility of trouble here.

As in the earlier engines neat ebonite caps cover the ignition plug pockets and prevent the accumulation of dust or dirt which might easily occur otherwise. The cylinder head is, of course, separate, as in the Knight engine, and this leads to certain convenience in the matter of the cleaning of the cored out portion and also facilitates cylinder boring. The manifold pipes through which the mixture passes to the cylinder are water-jacketed.

The Briton engine has cylinders 68 millimeters in diameter and a stroke of 120 millimeters. The cylinders are cast in pairs and a water space is allowed between each pair of adjacent cylinders. The pistons are perhaps shorter than is usual with this class of engine, being only 70 millimeters long and but three rings are provided, one of which serves to keep the wristpin in place. The crankshaft is 38 millimeters in diameter and the bearings are ample, especially the rear one against the flywheel, which has a length of 90 millimeters. There is, however, what appears to be an unnecessary overhanging of the flywheel, though it will be seen that the crankshaft is strengthened hereabouts to prevent the possibility of whipping.

The camshaft is a solid one and it is considerably enlarged at the bearings, which are three in number, so that the whole shaft can be pushed in endwise, the cams passing easily through the bushes. There seems to be no objection to this method of construction and it certainly makes for cheapness.

The valves have a diameter of 32 millimeters and it will be seen that the guides have hollow interiors. The hollowing of the guide presents an advantage in this wise: When the guide of the exhaust valve becomes slightly worn the escaping gas which usually is the cause of much annoying hissing noise would be checked in its flow by expanding into the pocket of the guide.

The valve tappets are furnished with fiber insets to deaden the noise of contact with the valve stems and at their lower ends the tappets have rollers 25 millimeters in diameter. The valve mechanism is inclosed to silence the action.

The construction of the Deasy engine in no way differs from the usual Daimler-Knight motor, which is, as usual, fitted with the Daimler vibration damper at the front end of the shaft. The object of this arrangement is to damp the vibration, which is caused when the periodicity of the crankshaft, considered as a spring, corresponds with the rate at which it receives impulses from the pistons. It will be realized that, however stiff the crankshaft is made, the fact that the drive is taken only from one end tends to allow the front crank throw, under explosion pressure, to twist very slightly forward relative to the flywheel. This twisting effect is, of course, intermittent and is due to the natural elasticity of the crankshaft, which when the impulse is

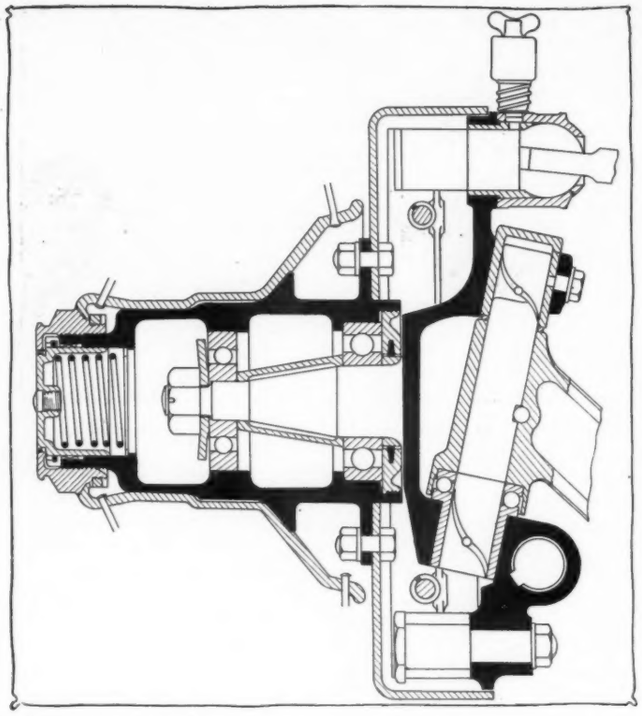


Fig. 15—Steering knuckle and front wheel mounting on the Argyle

removed, springs back to its normal position. When, however, the piston impulses correspond to, or become multiples of, the natural period of the crankshaft, considered as a spring, then the amplitude of torsional oscillation is considerably increased. The vibration produced in this manner which is found on all six-cylinder motors, and also on four-cylinder ones to a less extent, is produced only at certain definite engine speeds. In order to overcome this trouble the special vibration damper referred to above is fitted to the front end of the crankshaft, and consists of a supplementary flywheel not positively attached to the crankshaft, but driven through what is practically a multiple-disk clutch. When the periodic vibrations commence, the inertia of this frictionally driven flywheel causes it to slip, thus preventing the synchronization of the various disturbing forces and causing the vibrations to neutralize one another.

The carbureter fitted by the Deasy company is one of its own design, and as shown in Fig. 7. The throttle is of the butterfly type and works in a water-jacketed casing. Immediately below this is the casting which forms the float chamber, and through the center of which is the passage containing the jets. These jets are mounted on a hollow cross-bar which is cast integral with the float chamber and within the central passage is a valve so arranged as to slide freely in a vertical direction.

The float is of the annular type and surrounds the jet chamber, as shown in the section. It operates the needle valve contained in the upper part of the carbureter, which also carries a plunger, by means of which the float may, when necessary, be agitated. The gasoline is led directly to the inlet valve and need not be detached so long as the upper part of the carbureter remains attached to the inlet pipe. The whole of the bottom half, containing the annular float, jets and the sliding valve, is instantly detachable by partially undoing a couple of thumb-nuts.

The arrangement enables the engine to accelerate with extreme rapidity. As mentioned above, this is brought about by the inertia of the valve, which causes it to lag behind momentarily when the throttle is opened suddenly. This means that for a fraction of time a very powerful suction is placed upon the pilot jet, thus giving the engine a very rich mixture, which is gradually weakened as the valve rises. This prevents any tendency to fire back into the carbureter when a sudden opening of the throttle takes place.

The New Star Company is producing five models for the coming season, two of which are entirely new and have engines with long stroke, as shown in the table and in the description which follows:

Horsepower	Cylinders	Bore and stroke
10/12	4	80 x 120 millimeters
12/15	4	80 x 120 millimeters
15.9	4	80 x 150 millimeters
20.1	4	90 x 150 millimeters
23	6	80 x 120 millimeters

The 10-12-horsepower model has en bloc cast cylinders and the unit method of combining engine clutch and gearbox. It has a strong two-bearing crankshaft, a camshaft driven by spiral gear, magneto ignition, thermo-syphon cooling and force-feed lubrication.

The 12-15 model is the same as that known last season as the 12 horsepower. The cylinders are cast in pairs and the units are carried separately in the frame. There are four speeds and a reverse.

The 15.9 horsepower and the 20.1 horsepower are entirely new models and their design is practically identical.

The cylinder diameter of the 20.1-horsepower motor is 90 millimeters and the piston stroke 150 millimeters. The connecting-rod is of about usual proportions, that is, about two and one-sixth times the stroke, though it has the appearance of being a little longer than this. As the cylinders are off-set, the pistons can be short, and they are in fact only a trifle longer than the cylinder diameter. The crankshaft journals have a diameter of 50 millimeters and are three in number. The cylinders of each pair are very closely placed, there being only the smallest film of water between them. This fact, though a little objectionable from the point of view of the cylinder, is advantageous to the crankshaft and enables a strong compact shaft to be employed. Thus the central web of the crankshaft is not inclined to suit the crankpin as is sometimes necessary and it has a depth of 35 millimeters. The center lines of the crankpins fall immediately below the cylinder centers, so that the thrust is evenly distributed over the journal and this is a very desirable feature. The camshaft has a diameter of 30 millimeters and the cams are cut solid upon it.

The ignition of the Star motors is by the high-tension Bosch system. This follows the usual English practice which is decidedly away from battery, dual or double systems. High-tension ignition alone being fitted. Lubrication is by means of the splash system.

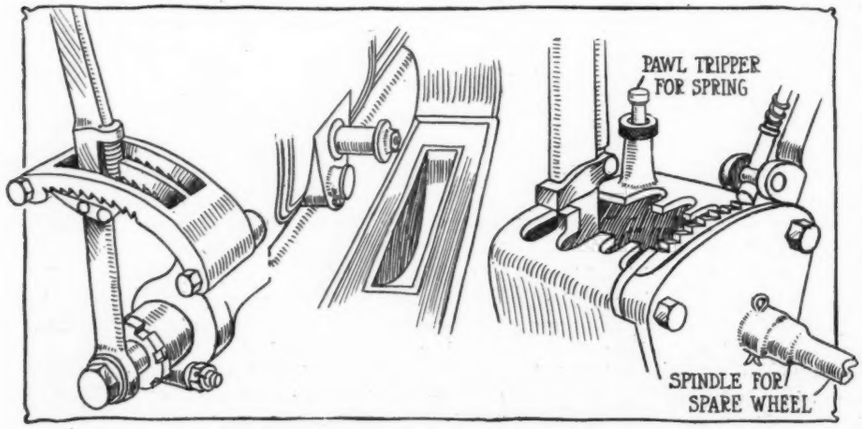


Fig. 16—Daimler change speed gate and exterior and interior view of spare wheel spindle on Talbot cars

Three of the Daimler models have been retained for the season 1913 and two added, as given in the following table:

Horsepower	Cylinders	Bore and Stroke
20	4	90 x 130 millimeters
26	4	101 x 140 millimeters
38	4	124 x 130 millimeters
30	6	90 x 130 millimeters
39	6	101 x 140 millimeters

From the above it will be seen that the 80 by 130 has been eliminated and will be no longer constructed. The 90 by 130 is retained at a slightly increased price. The four-cylinder 101 by 130 will in future be made with a stroke of 140, and is practically a new model. The 38-horsepower four-cylinder 124 by 130 remains as last year. The six-cylinder 80 by 130 will not be made in the future, and in its place a six-cylinder 90 by 130 is substituted. The large six-cylinder model 101 by 140 is retained. The stroke of this engine has been increased to 140 millimeters.

As regards the 20-horsepower model, only minor alterations have been made in connection with this type. With the engine a slight improvement has been effected in the lubrication arrangement. As is well known the Daimler lubricating system in connection with the Knight engine consists of a multiple-plunger pump which supplies filtered oil to troughs placed beneath the connecting-rods, these troughs being adapted to be raised or lowered to suit the varying speeds of the engine.

The new 26-horsepower model, bore 101 by 140 stroke, has, as usual, the cylinders cast in pairs, but they are placed out of center with regard to the crankshaft. The amount of this désaxé setting is 13 millimeters.

Another modification of the previous Daimler practice consists in setting the magneto and pump shaft parallel with the crankshaft instead of being set across at the front and driven by spiral gearing. In the new model silent chain drive is employed.

The Clement Talbot Company is not introducing any new sizes in its engines for 1913. Four models will be constructed as follows:

Horsepower	Number of Cylinders	Bore and Stroke
12	4	80 x 120 millimeters
15	4	90 x 140 millimeters
20	6	80 x 120 millimeters
25	4	101 x 140 millimeters

The following are the chief characteristic features of all seven models: Cylinders cast in pairs; all valves in line and interchangeable; camshaft operated by spiral gearing; pump for lubrication and water circulation; Bosch dual magneto ignition with variable control; leather-faced cone clutch; gearbox with four speeds and reverse; bevel drive; inclosed driving shaft from gearbox to back axle, and semi-floating live axle.

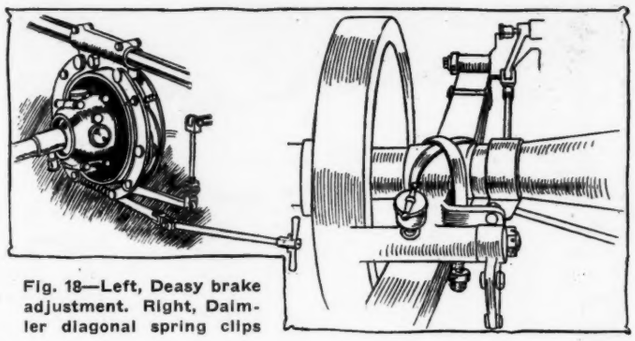


Fig. 18—Left, Deasy brake adjustment. Right, Daimler diagonal spring clips

Engine lubrication of the Talbot cars has received most careful attention. The oil pump is of the rotary type and driven vertically by spiral gearing from the camshaft. The circulation is indicated by a gauge fitted onto the dashboard. For the distribution of the oil the crankcase is furnished internally with a pipe from which branches are taken to each crankshaft bearing. The crankshaft is drilled, through which the oil passes to the big bearings. Fig. 5 shows the six-cylinder crankshaft with connecting-rods attached.

The large use of cone clutches and four-speed gearsets is well brought out by a study of what a few of the representative makers are doing in this line.

No change has been made in the leather cone clutch on the Daimler, but the universal joints of the clutch and gearbox have been made with large bearing surfaces. The gearbox now has the layshaft driving gears at the front end, as with last year's cars, the sliding universal joint of the fore and aft shaft is placed behind the gearbox. The reason for this practice being that the travel of the sliding bearing is thereby reduced while the action of the universal joint is further reduced by the placing of the rear springs beneath instead of above the axle. Another advantage of this arrangement is the smoother driving

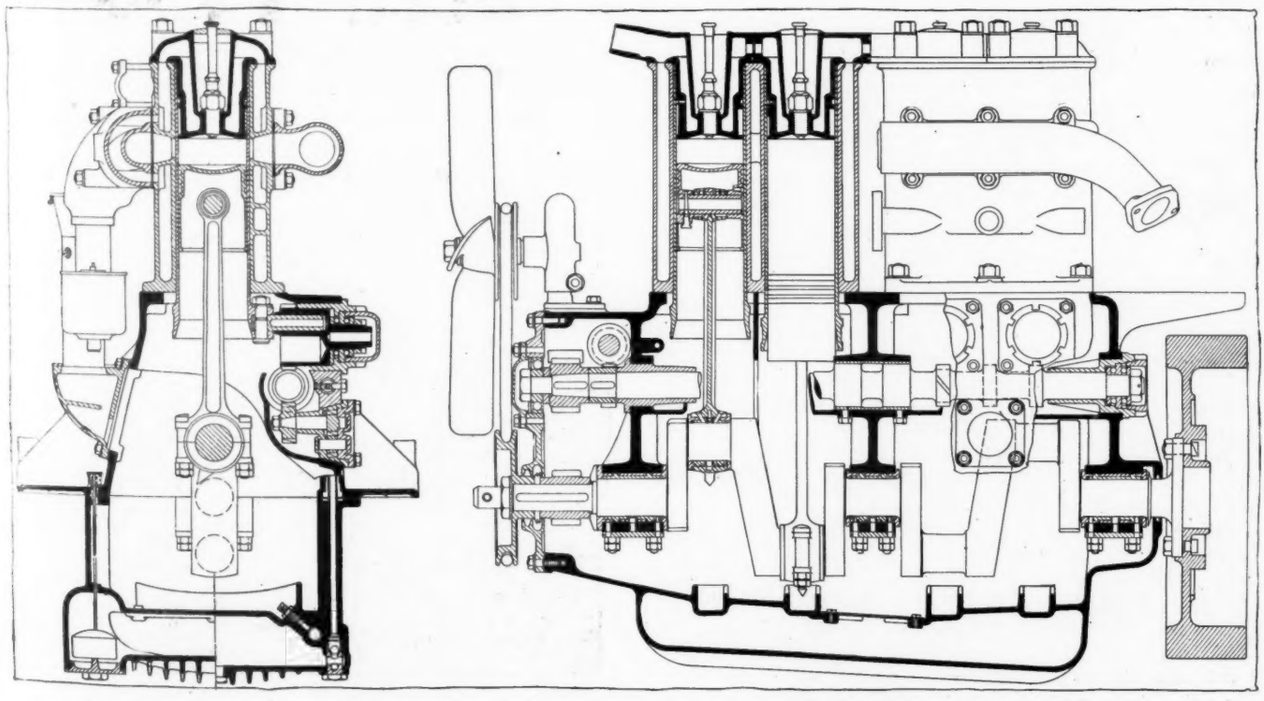


Fig. 17—Transverse and longitudinal sections of the Argyle sleeve motor continued for 1913 without radical change

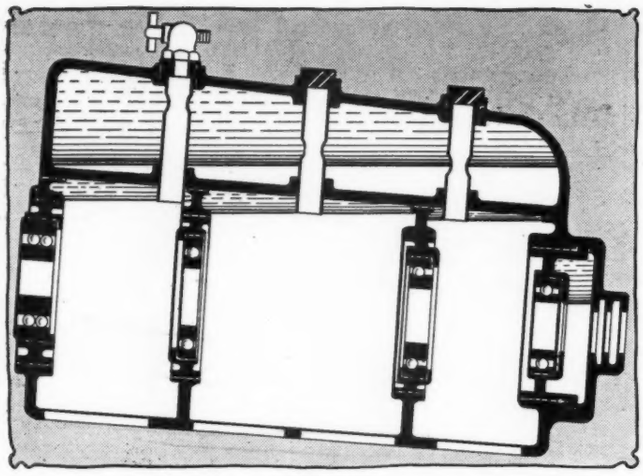


Fig. 19—Oryx crankcase, showing the unique oiling system

and braking action and the lowering of the frame height from the ground.

The Wolseley clutch is of the multiple all-steel disk type and thirty plates are employed inclosed in an oil-tight casing. A split-plate universal joint is fitted between the clutch and the gearbox. The gearbox, particulars of which have already been given, is provided with four speeds. The front end is centrally bolted to a double cross-stay which also carries the brake shaft and clutch levers. The rear end of the gearbox is bolted to the channel section frame cross-member. A three-joint suspension is thus provided.

With the Humber cars the clutches are of the leather type and are so inclosed within the flywheel that they are not affected by dirt or moisture. An aluminum cover plate is provided, and the clutch works entirely in oil.

On the Swift car the clutch is a leather cone with springs under the leather to allow of easy engagement. The four-speed gearbox is actuated by gate change, the gear wheels themselves being supported on short castellated shafts mounted on suitable load ball bearings, a special feature of this box being the design of the layshaft as all the gears on the latter are separate units.

The Arrol-Johnston clutch is of the floating-plate type, a plate gripped between two others, the whole running in oil. The clutch is readily adjustable and as the rotating part is very light, gear changing is rendered an easy matter. The clutch cross-bar is held in adjustable bearings, and it is claimed that this method of mounting is responsible for an absence of all chattering of the clutch pedal—a source of annoyance in some cases.

The Adams clutch is of the leather-faced cone type with a somewhat unusual spring arrangement embodied in the design. The spring, instead of being placed behind the male clutch disk is in front of it. The clutch shaft is hollow to receive the crankshaft spigot and at its inner end there is a disk screwed on and locked to act as an abutment for the spring. A cap screwed over a cylindrical extension of the flywheel and female clutch member serves to adjust the compression of the spring, and a ball thrust bearing is situated within the cap. There is, moreover, a special locking ring from the adjusting cap and this is provided with a set-screw to receive it. A ball thrust bearing is provided on one of the forks of the flexible coupling which comes into play when the clutch is disengaged, a coiled spring keeps the two thrust disks of the bearing in position. There is a well-designed universal coupling to permit some flexibility between engine and gearbox, and a De Dion type of joint is provided in which a malleable cast iron pot is provided with case-hardened steel working surface held in place by pegs and a steel back plate. The clutch pedal operates through a link and bell crank lever.

Belsize combines the clutch and gearbox, the whole forming one unit. As regards the clutch, this is of the metal-to-metal variety and both members are of cast iron. The diameter of the male member of the small end of the taper is 10 inches and the width 2.375 inches. A very stiff spring is used, having six coils of round steel .375 inch in diameter, and a good ball thrust bearing is provided to come into play when the clutch is disengaged. The spigot bearing from the clutch is 1.25 inch diameter and 4.125 inches long and has a phosphor-bronze bushing.

The Vauxhall clutch is of the multiple-disk type. There are thirteen driving plates and twelve driven, adhesion being secured by a helical steel spring 3.5 inches in diameter. The shaft which transmits the drive from the clutch plates to the universal coupling is 1.5 inches in diameter, and attachment is made at both ends by means of taper and key. The flywheel, to which the outer casing of the clutch is attached, has a diameter of 16.25 inches and a rim width of 3.25 inches. The spring load on the clutch spring can be varied by revolving the cup-shaped casting in one direction on the other, subsequent locking being performed by screwing up the ring-nut. A ball bearing supports the forward end of the clutch shaft.

The New Star clutch is somewhat interesting in that it is a leather cone clutch completely incased at the back. This casing permits the use of oil. Some of the advantages of the plate clutch are present and, as will be remembered in the diagram recently published, the leather cone clutch is not at all failing in popularity. It is believed that clutches of this type are to be far more numerous than in the past.

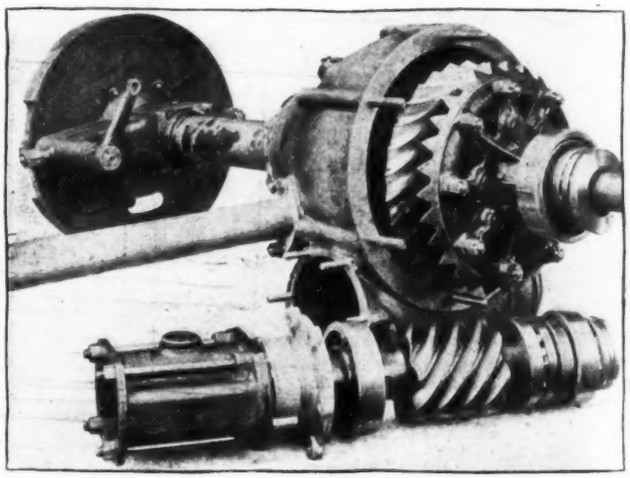


Fig. 20—Worm drive on Napier 15-horsepower car

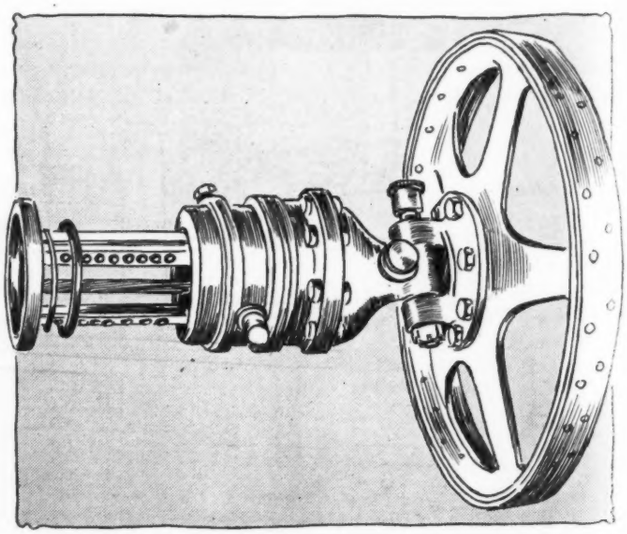


Fig. 21—Leather-faced cone clutch in use on the Germain-Knight

The Argyle clutch is of the plate type and has forty-five plates. A peculiarity of the design is that there is no extension of the crankshaft to support the clutch shaft, but this shaft is supported in a ball bearing held in the flywheel.

Three speeds and a reverse are provided on the Briton car with a direct drive on the highest speed. A peculiarity of the construction at once noticeable is the fact that both plain and ball bearings are in use; the short shaft which first receives the drive of the engine has a plain bearing with a phosphor bronze bush; the spigot bearing is likewise a plain bearing, while the remaining bearings are ball bearings. Of the gears on the secondary shaft two are cut solid with the shaft and the remaining two form a part of a single forging.

A three-speed gearbox is applied to the Bell cars. This gearbox is characterized by the arrangement of a sliding sleeve on each shaft, which has the effect of throwing the layshaft completely out of gear when the direct third is engaged.

The Maudslay Company last year was conspicuous in the use of a chain-driven gearbox. A return has this year been made to the orthodox spur-gear type. The worm drive to the back axle has also been dropped by a return to the bevel, Fig. 23.

The whole of the Napier change-speed mechanism is fitted within the gearbox, gears being changed by a partial rotative and transversal movement of the cross-valve and sliding sleeve. An innovation with regard to gearbox is the fitting of ball bearings in the place of rollers, which have hitherto been used.

Rear axle, brake, torque rod and other chassis construction

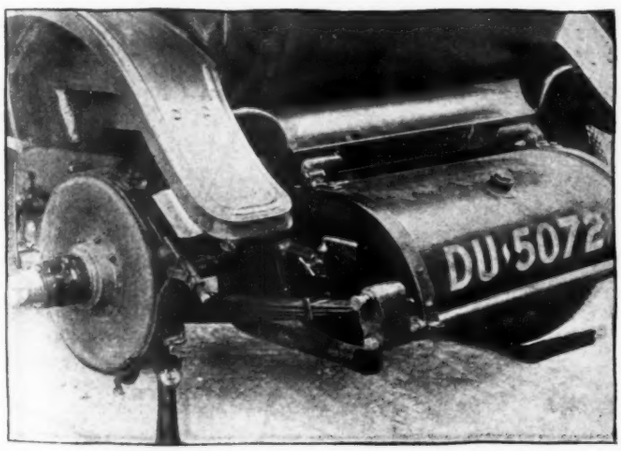


Fig. 22—Rear view of new Daimler 26-horsepower car

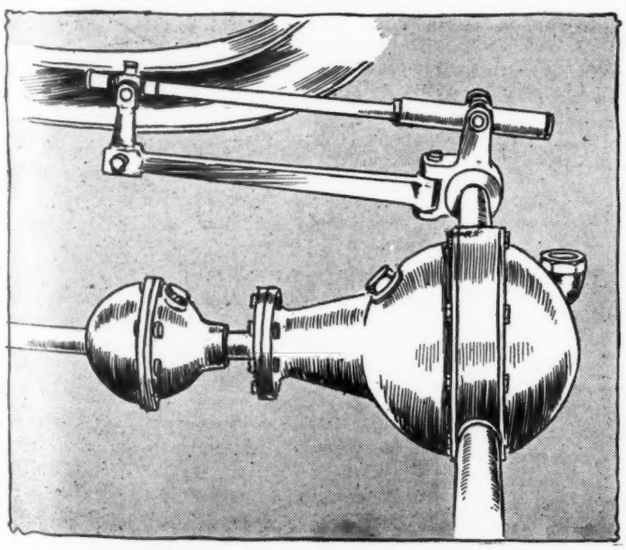


Fig. 23—Simple construction a feature of Maudslay rear axle

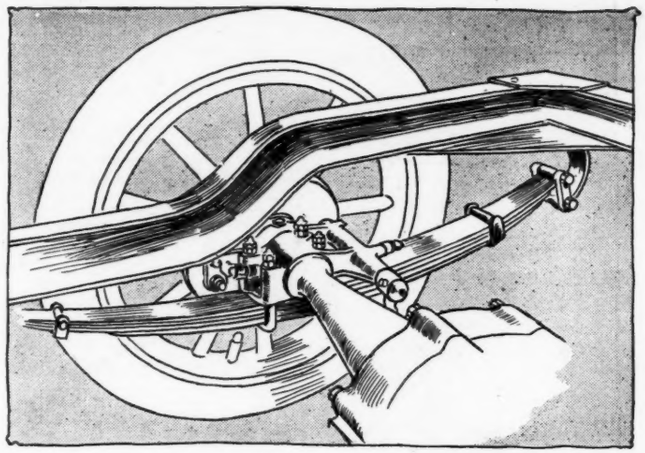


Fig. 24—De Dion returns to the underslung form of rear suspension

details have been given special attention by the English engineers as the following points will illustrate:

The Deasy foot brake is on the propeller shaft. The brake shoes are supported on a stout cross tube, carried by the side-members of the frame. This is generally a better system than that of carrying the brake shoes on studs secured to the gearbox. A ready means of adjustment is provided and is operated by means of a handle which extends slightly beyond the side-member of the chassis, so that this operation can be carried out in a moment without taking up any floor-boards or getting underneath the car. The handle actuates a screw which forms a link connecting the two halves of the brake together, and by which they are equally and simultaneously operated.

The rear brakes are internally expanding and are expanded by cams carried on brackets formed in one with the back axle casing. They are applied differentially by a compensating device which is connected to the hand lever.

The gasoline tank is carried under the scuttle dash and feeds by gravity, the lever of the pedal being arranged at such a height to give sufficient hold to feed the carbureter on the steepest incline.

The rear axle on the B. S. A. has an overhead worm. The road wheels are provided with a single ball journal bearing, thus a small proportion of the load is taken on the axles, which, however, are 30 millimeters in diameter. The permanent hubs are driven through a key and the Rudge-Whitworth type detachable wheel is fitted. Lubrication for the ball journal bearing is provided for by the removal of a screw plug, the lubricant passing through small drilled holes in the axle and thence into a shallow groove in the permanent hub. As the hub is fixed by means of a single key only, the groove must necessarily coincide with the small drilled hole in the shaft.

The return to the bevel drive by the Maudslay company indicates the improvements that have been made as regards the means for rendering the bevel gear more silent in action. Just as the Knight engine compelled manufacturers and designers to set about the adoption of means to render the tappet valve engine more quiet, so the introduction of the worm drive has led to great improvements being made in the method and means of hardening bevel gears to prevent warping, the chief cause of noise. One system employed with crown wheels is to copper-plate all except the teeth. The coated part is then not affected by the cementation process, and the wheel after dipping and the teeth hardened can be more easily got true. The fixing of a substantial tail bearing at an extension of the pinion shaft is found in connection with the Maudslay chassis.

Parallel torque and tension rods are also fitted. The springs are three-quarter elliptical, very long and wide, with the frame upturned over the back axle.

(*To be continued.*)

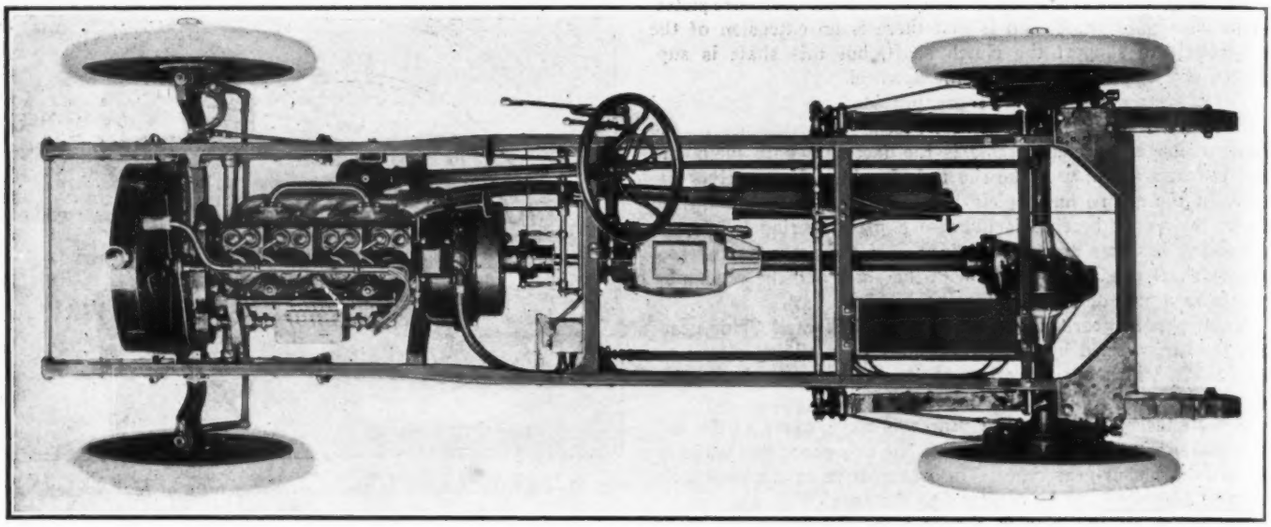


Fig. 1—Rambler Cross Country chassis, showing arrangement of torque, drive and suspension members

Rambler Drops All But the Cross Country Model

Principal Changes for 1913 Include Fitting of Electric Starting, Lighting and Ignition System; Change in Motor Dimensions and Fittings; Adoption of Cone Clutch and Adjustable Steering Column

FOR the season of 1913 there will be but one Rambler chassis on the market. This model, which is to be known as the Cross Country, will combine all the refinements which the Thos. B. Jeffery Company has made up to date. Among the prominent features are the combination electric starting and lighting system, the adoption of the Stromberg carbureter, increase in valve dimensions, longer connecting rods, better placing of wiring, adoption of the cone clutch, shortening of the hand stroke required to shift gears, simpler brake connections, and an adjustable steering column. The larger model Rambler which embodied a motor with a bore of 5 inches and a stroke of 5.5 inches has been discontinued. This was a heavier model.

Taking up the power plant which is designated by the makers as a gasoline-electric, it may be said that the gasoline engine has four cylinders of the L-head type with valves on the right side. The cylinders are cast separately and are 4.5 inches both bore and stroke. Though the motor has three bearings the use of the self-starter has not necessitated the addition of another bearing between motor and flywheel. The offset crankshaft which has been a feature of Rambler construction for many years is continued. It is shown in Fig. 3 together with the principal dimensions, but the connecting rods have been lengthened slightly to give less wear between pistons and cylinders.

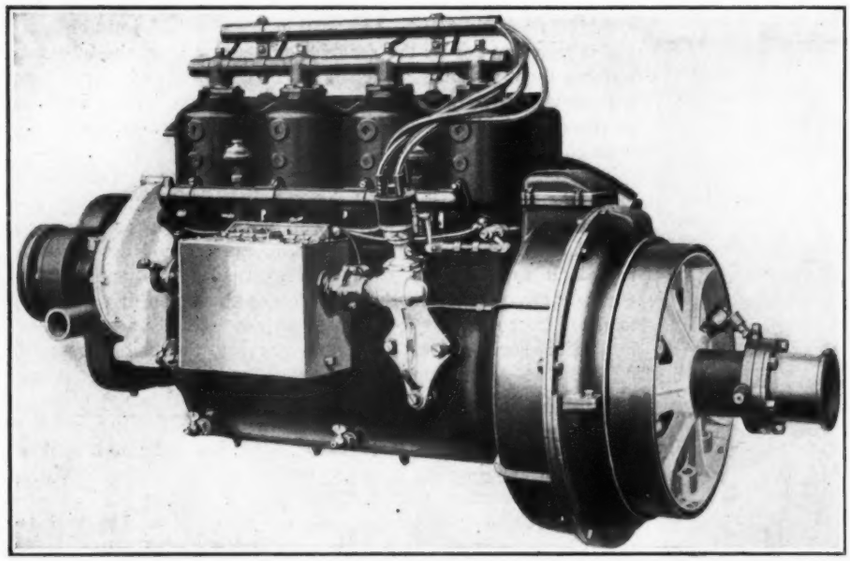


Fig. 2—Mounting of new mechanical oiler, showing longitudinal shaft drive and cone clutch

Both intake and exhaust valve have been increased to 2.125 inches in diameter and are interchangeable. The only other alteration in the motor is in the use of a Detroit mechanical oiler of 2 gallons capacity, located on the motor base at the left of the cylinder, Fig. 2. The oiler is a seven-feed type with four oil tubes leading to the cylinders and the remaining three to the crankshaft bearings. A splash is contained within the crankcase. The supply of oil is contained directly in the box that also houses the plunger pumps which send the oil through the leads to the different bearings and to the cylinders. This gives a combination of force-feed and splash although the system is non-return and non-circulating. As will be seen from the illustration there is a longitudinal shaft which passes through the mechanical oiler box terminating at one end at the timing gears from which it is driven and at the other end

at the timer which is actuated by the shaft. Within the oiler box are seven small plunger pumps each operated from the longitudinal shaft by a small crank. By an ingenious arrangement the length of the stroke of each of these pumps can be lengthened or shortened by means of a nut located on top of the mechanical oiler box. When the stroke is shortened the supply of oil given through the lead that that particular pump takes care of, is correspondingly decreased. In the bottom of the crankcase are located draincocks which may be opened to allow the surplus oil which will gather in the crankcase in time to drain off. The filler hole for the mechanical oiler is located in the top of the box in the usual manner. Besides this there are two breather pipes communicating with the crankcase through which an additional supply of oil may be poured when it is desired to fill the crankcase, such as when the car is used for racing or if the supply in the crankcase has been removed while the old oil was cleaned out. The motor suspension is continued as a three-point support, a tubular cross piece, 2 inches in diameter, forming the front supporting members. The entire motor is mounted at a slight rearward slope to give a straight line drive to the rear axle.

Another change is in the use of a Stromberg carbureter with a hot-air jacket from the exhaust manifold on the footboard. Immediately in front of the steering post is a push button by which the air intake may be closed to give a richer mixture on starting. The new type of radiator, Fig. 8, which appeared for the first time in the 1912 cars is continued in the 1913 Cross Country. A belt-driven fan immediately behind the radiator is driven from the shaft upon which drives the pump and assists the latter in maintaining the cylinder cooling. Ignition wiring has been changed from position at the right side of the cylinder to a point immediately above the water manifold, where it is incased in a waterproof tube, as is shown in one of the motor illustrations.

Immediately behind the motor-generator-flywheel, which is hereinafter described, and partially within its housing is the clutch. The latter embodies a decided alteration from previous Rambler design in that for next year it is of the cone type instead of the internal expanding type which has been heretofore one of the features of this product. The new clutch is shown in Fig. 4 and is a direct acting cone in which gradual engagement is obtained by springs under the leather facing.

Located amidships on the chassis frame is the three-speed selective gearset, which embodies a slight change in design for 1913. The arrangement of the gears and control connections have been altered slightly, in order to decrease the movement of the hand required in changing speeds; heretofore it has necessitated a movement of the top of the gearset lever of nearly 1 foot, whereas, in the new arrangement the total movement is but 6 inches. There has been no change in the propeller shaft or rear axle, the latter being rigidly connected to the gearset by means of a torsion tube surrounding the propeller shaft. On each side of the propeller shaft tube are the torsion rods which, as for the past year, are in V form, the spreading arms attaching to vertical arms on the rear axle housing as shown in the chassis view, Fig. 1.

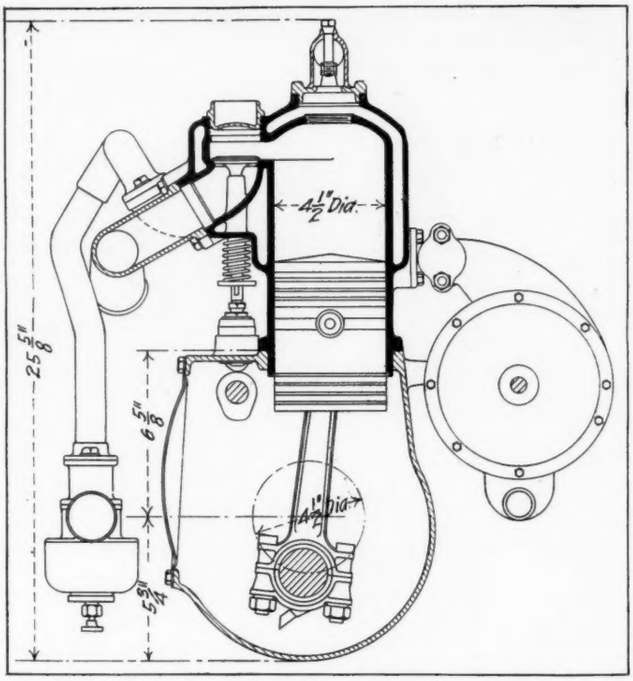


Fig. 3—Rambler 1913 cars will have longer connecting-rods and larger valves

The rear axle is of the floating type with roller bearings, drive axle shafts and gears forged integral and the wheels secured to the square taper axle end. The front axle is a drop-forged I-beam with an adjustable taper roller bearing.

The brakes are internal expanding and external contracting on the rear wheel drums, which are 14 inches in diameter and 2 1-2 inches in width. There has been a slight alteration in the brake connection which makes for simplicity in the new models. The

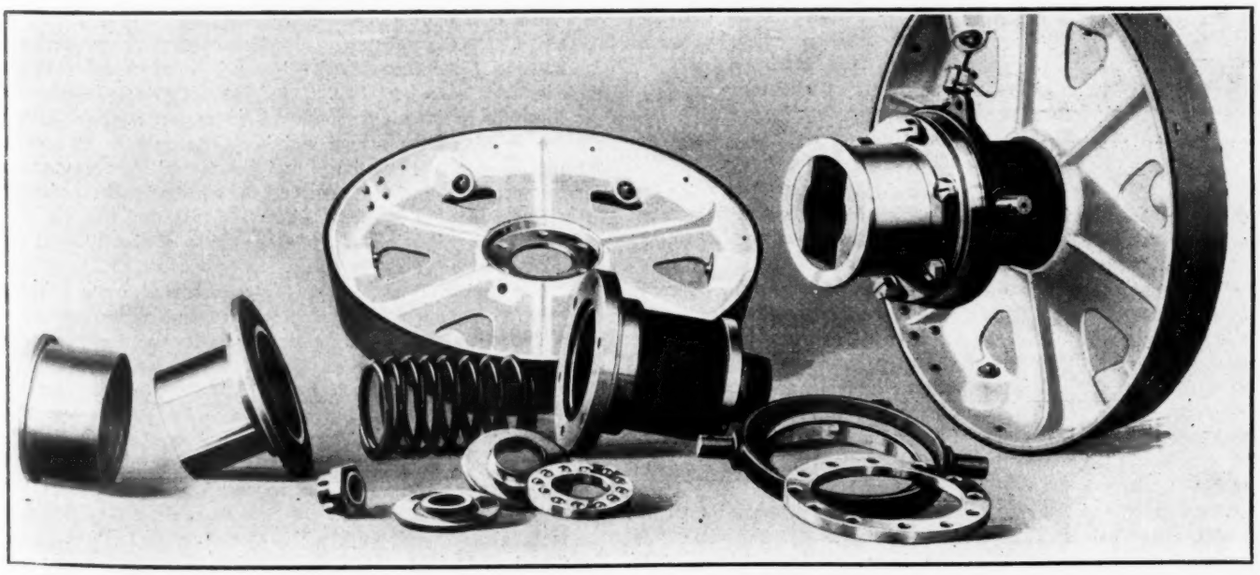


Fig. 4—Disassembled view of the cone clutch. New on the Rambler car for the 1913 season

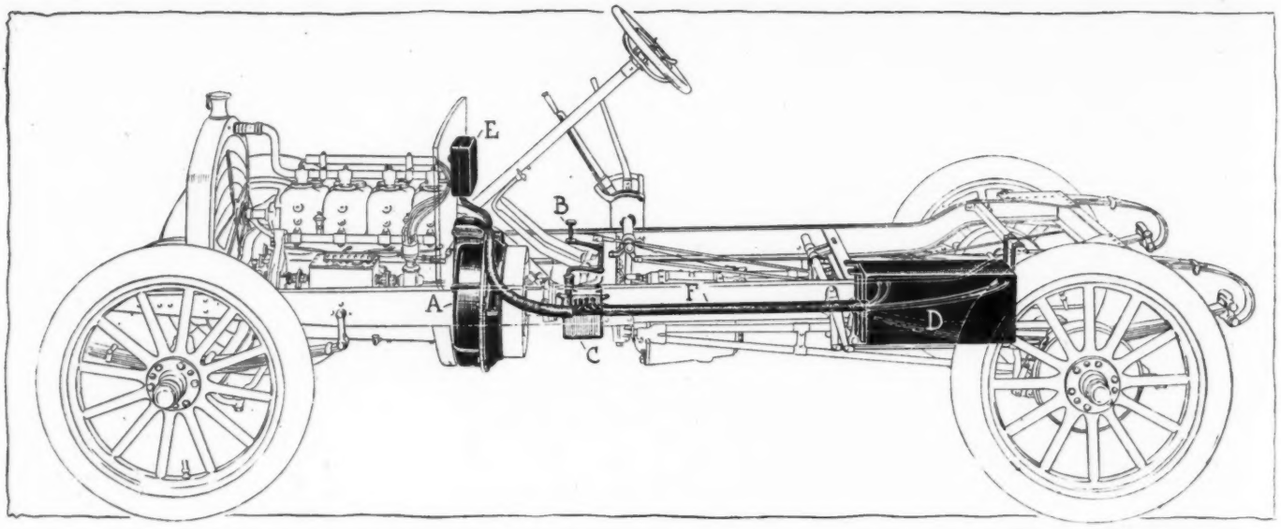


Fig. 5—Starter mounting. A, motor-generator; B, control; C, switch; D, accumulator; E, regulator, F, conduit

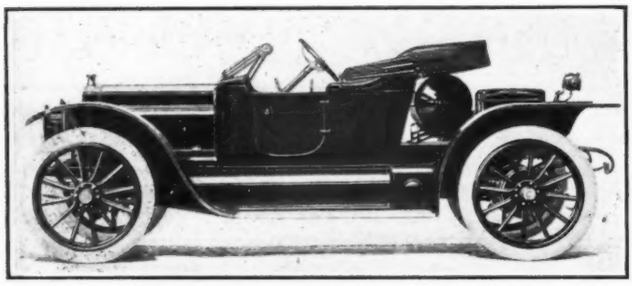


Fig. 6—Rambler roadster with rumble seat fitted aft of tank

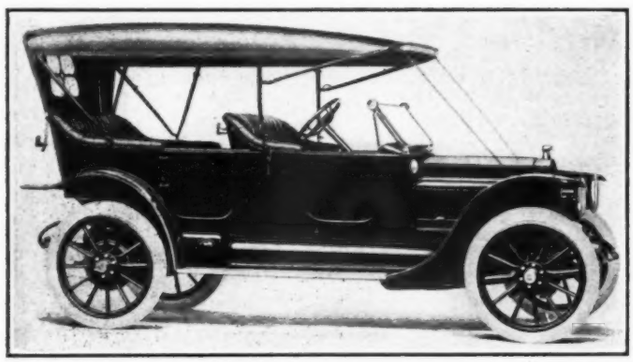


Fig. 7—Five-passenger touring car, Cross Country model, with full equipment

countershafts for the two brakes which formerly were separated, are now combined in one; one being located within the other; the outer one being in the form of a tube.

The frame construction is the same as that of the present model, being a tapering straight-line channel to just forward of the rear axle where there is a kick-up to clear the latter. Wide gusset plates are provided at the corners to prevent distortion. Springs are continued as semi-elliptic in front and three-quarter elliptic in the rear. The wheelbase is continued at 120 inches and the tires on all but one of the models—the Gotham, are 36 by 4 inches in size; with the latter body the tires are 37 by 4 1-2 inches in size.

Another one of the recent improvements which has been continued in the new model, is in the adjustable steering pillar. The steering column is hinged to the frame and the column rises through a slot in the floor. A metal plate through which this column passes covers this slot. The under side of the slot is serrated and these serrations mesh with others on the floorboards. Clamping bolts hold the plate in any desired position and by loosening the bolts the plate may be moved forward or aft, giving the steering column any desired tilt.

The starting, lighting and ignition system which is unique on account of its unit construction with the motor and because it is the first starter that has been fitted to the Rambler cars, may be briefly described.

The chief factor of this system is the motor generator. This system comprises: 1, a dynamo, which performs the functions of both motor and generator and replaces the flywheel of the gasoline engine, 2, a storage battery, 3, a switch operated by a foot pedal, and 4, a regulator, which is located upon the dash. The phantom view of the chassis shows these four elements as they are installed in the car. The chief portion of this system is, of course, the combination flywheel, electric motor and generator. As shown in one of the illustrations, the flywheel housing also has the function of the field frame, the eight field coils being wound on the cores which are bolted to the housing. Within this frame rotates the armature of the dynamo, taking the place of the usual flywheel and being attached to the crankshaft of the engine in the same way as the flywheel is attached. The crankshaft also carries the commutator, the brushes of which are carried on a ring just behind the armature and is held in place by bolts that pass through it for attachment of the rear portion of the housing. The fact that the flywheel is done away with permits its weight to be taken up in that of the dynamo so that the different parts can be made of ample size without increasing the weight of the system unduly. Consequently, all parts of the motor generator are large and substantial, the commutator, for instance, is 10 inches across and the carbon brushes, of which there are eight, are .75-inch square. It is stated that the total weight of the unit is slightly less than that of the flywheel that it replaces.

When running as a generator, the motor generator charges the storage battery at a 30-ampere rate and a pressure of 24 volts the controlling relay connecting battery and generator at speeds of from 8 to 10 miles per hour. To start, a foot button is pressed permitting current from the battery to run the motor generator as a motor at a voltage of 24 volts. The armature is rotated at 200 revolutions per minute and as the crankshaft of the gasoline engine is an integral part of the armature shaft, the engine is turning over at the same speed. Should the weather be cold and carburetion pure, the heat created by the friction of the moving parts, it is said, will warm them sufficiently to give the initial explosions. When the engine is running on its own power, the electric motor automatically changes into an electric

generator to charge the battery. Lights are supplied with current from the battery at pressure of 6 volts and ignition at 12 volts, the electric system displacing a magneto as a source of ignition current. The generator charges the battery at the rate of 30 amperes, while the current required for ignition, and lighting, is together 9 amperes, while it is stated that the amount usually required for starting is replenished within 2 minutes after the motor has attained a speed of from 10 to 15 miles per hour. The controller is designed to automatically disconnect the storage battery and generator when the speed of the motor drops below that sufficient to charge, so that there is no opportunity for the battery to discharge through the motor except for starting purposes. The starting button operates an oil switch on the chassis frame side member and the storage battery is hung between two cross members of the frame below the tonneau.

Five different bodies are fitted to the Cross Country chassis. These include a four-passenger touring, a five-passenger touring, a two-passenger roadster, a Sedan body with inside drives and seating four passengers and a Gotham or limousine body with inside drive, seating seven. The bodies are trimmed in nickel with body fenders and fillers of black enamel. The upholstering has been increased from 8 to 10 inches depth and a bumper has been fitted on the forward ends of the front springs. The electric lighting equipment includes 9 1-4 inches headlamps with port dashlamps flush with the dash line. The rear lamp is mounted on the fender and has a twist switch so that it will comply with local city ordinances.

Aside from standard equipment, the features of the Cross Country roadster, in the matter of accessories, is that of the trunk rack with two suit cases; the two closed bodies are trimmed in gray bedford cord with electric piller lights between driver's seat and rear compartment, in the case of the Gotham body, and electric dome light in case of the Sedan.

Harking Back a Decade

FROM *The Automobile and Motor Review*, November 15, 1902: Emil Grossman has sold his interest in *The Automobile and Motor Review* to H. M. Swetland. Mr. Grossman will retire from the company immediately.

Commander Wells, of the London Fire Brigade, has introduced an automobile fire engine into the metropolitan service. His experiment consists of converting a horse-drawn steamer into an automobile, the work being done in the shops of the department. The propelling engine is a two-cylinder steam motor.

M. H. Kilmer, of Ocean Grove, N. J., recently spent 27 days in touring the Catskills. It rained 14 days of the time, but Mr. Kilmer, who was on vacation, declares that he never enjoyed a tour so much as the one he made. He kept an approximate record of his mileage, and says that he averaged nearly 100 miles a day. His total repair bills were $3.30.

A straightaway speedway for the exclusive use of automobiles is being planned across the Jersey Meadows, connecting the west bank of the Hudson with the excellent highways in the northern part of New Jersey. The plan involves the laying of concave steel rails in a slightly crowned road surface. It is planned to sow grass seed between the rails to solve the dust problem. W. J. Stewart, of the Automobile Club of New Jersey, is the proposer of the plan.

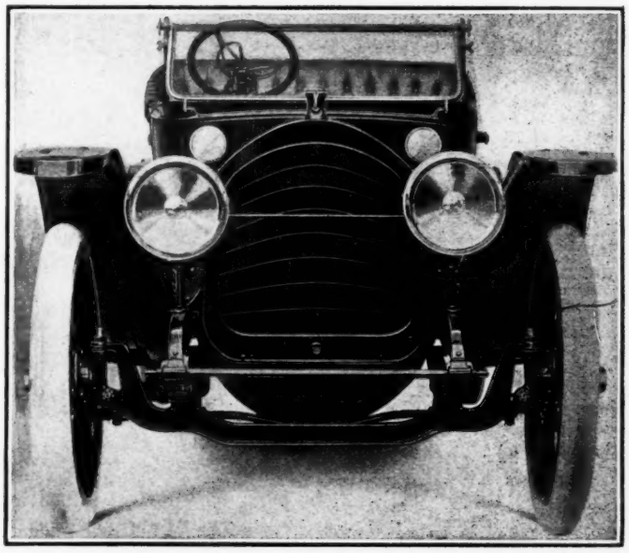


Fig. 8—Front view of the Cross Country, showing radiator adopted last year

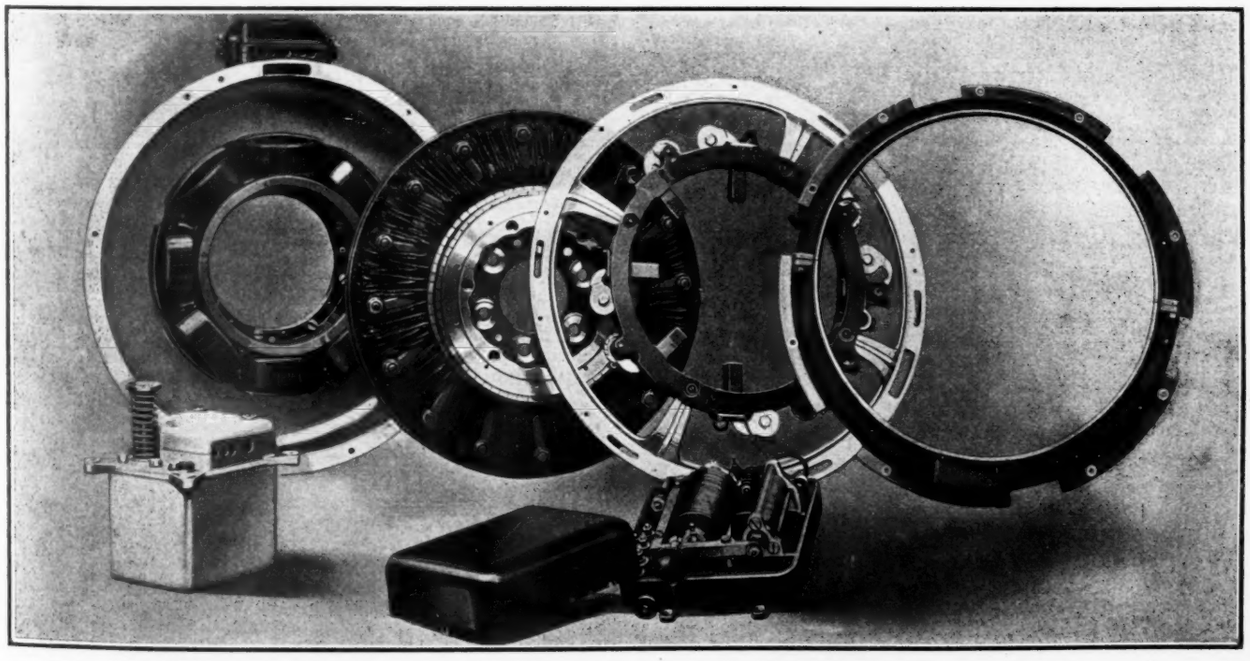


Fig. 9—View of the assembly of the motor generator, the switch, starting button and dash regulator

Factory Miscellany

Giant crane which runs the length of the frame arm of the factory. The crane spans that section of the factory and has a track 800 feet in length

QUANTITY production means the necessity of transferring tons of material through a considerable distance. Reduced to ton-miles the amount of work done in the Ford factory would astonish the average individual. The above illustration shows one of the cranes that render possible the speed at which the Ford car is turned out. Every 58 minutes a car is assembled. A constant supply of heavy parts must be delivered to the assembling room so that there shall be no delay. These cranes do the work. As may be seen from a study of the illustration, the crane extends directly across the frame arm of the factory. The length of the track is 800 feet and the crane can travel this distance at a speed of about 15 miles an hour. Throughout the factory the Ford company has eliminated the truckman and nowhere are to be seen men who struggle behind an overloaded truck, a common sight in many factories. One of the most useful cranes is a big gantry crane not shown in the illustration that labors in connection with the foundry. This crane on stilts walks along over freight cars, picking out their loads of pig iron or scrap or shoveling out their loads of sand. It has a 6-ton clam shell shovel for raising sand and gravel. It hoists pig iron and scrap with a gigantic magnet. This is dropped into the metal and current thrown on. It is then raised, covered with bars of pig and pieces of scrap. When this load is over the place where it is desired to deposit it, the magnet is lowered and the electric current switched off. The magnet is a magnet no longer and the metal drops.

NEW SYRACUSE FACTORY—The New Process Raw Hide Company, Syracuse, N. Y., has erected additions which the company claims makes its complete plant the largest single plant in the world devoted exclusively to gear-making and gear-cutting. The latest additions are a four-story and basement wing extending 65 feet by 180 feet at right angles to the old building and a heating plant in the rear 60 feet by 50 feet housing three 125 horsepower boilers. The new buildings are fireproof throughout, having steel framework, reinforced concrete floors, concrete roofs, brick curtain walls and steel window sash. New equipment to the extent of $100,000 has been installed. The accompanying photograph shows the factory.

Syracuse Company Moves—The Precision Die-Casting Company, Syracuse, N. Y., has moved into its new offices and factory.

Cadillac Factory News—The Cadillac Motor Car Company, Detroit, Mich., is now turning out sixty cars a day, having a force of 5,500 men.

Goodrich Entertains Clevelanders—The B. F. Goodrich company, Akron, O., recently entertained at its factory 410 members of the Cleveland Chamber of Commerce.

Cutting's Kansas City Factory—The Cutting Motor Car Company, Jackson, Mich., has completed arrangements for a branch factory at Kansas City, Mo., to cover western territory.

Gregg Starts Body Factory—W. S. Gregg has started in a business for himself, in a new modern two-story brick building, Los Angeles, Cal., erected for the purpose, where he will manufacture automobile bodies, windshields and rims.

Canadian Factory Progress—In 10 years automobile plants in Canada have increased 4,559 in number, $798,829,009 in value of capital, 175,108 in number of persons employed, $127,274,301 in earnings of salaries and wages and $683,722,157 in value of products.

To Build Beaver Six—The Beaver Six is the name of a new automobile to be manufactured in Portland, Ore. A group of Portland business men have filed incorporation papers for the $300,000 Beaver State Motor Company. The first automobile has been manufactured and in a short time announcement will be made of the site of a $30,000 plant. P. A. Coombs and J. A. Friddle are the designers of the car, which will be on two models, roadster and touring car of 45 horsepower.

Growth of Canadian Industry—The growth of Canadian manufacture is well illustrated by the progress being made by the Brockville, Ont., Atlas Automobile Company. This company will build additions in the near future that will triple the present premises.

To Manufacture Trucks—Theodore D. Gere and Frank B. Tracy, of Owego, N. Y., have formed a partnership to manufacture a commercial motor truck and negotiations are in progress for leasing the Robert Nichols building in Owego for the manufacturing plant.

Orders New Equipment—The Lewis Electric Welding Company, has placed an order for new equipment which will increase both its scope and output. The company has materially increased its capitalization and will soon enter upon the manufacture of an increased line of automobile parts.

Toledo Company Adds—The Electric Auto-Lite Company, Toledo, O., will build an addition to its plant in that city, providing for 40,000 square feet of floor-space. The work is already under way and the company expects to be installed in the new building before January 1.

Moon Installs Equipment—The Moon Motor Car Company, St. Louis, Mo., plans to make further improvements to its plant and to install a large amount of new equipment. During the past season, additions have been made to the plant which more than doubled its capacity.

Accessory Plant Planned—The Ernest Lee Machine Company, Cleveland, O., has had plans prepared for the construction of a factory for the manufacture of automobile accessories. The plans call for a one-story brick structure, 100 feet by 320 feet, at an estimated cost of $15,000.

To Build Truck in Boston—The Frank Rilion Company, well known in the electrical field in New England with headquarters in Boston, has decided to build motor trucks of from 1 to 6 tons capacity designed by Victor J. Houdon. The vehicles will be built in the present workshops in South Boston.

Visit Cleveland Plants—The engineers of western Pennsylvania, with headquarters at Pittsburgh, have arranged with the Cleveland Engineering Society for a joint inspection trip through several Cleveland manufacturing plants, including the Winton Motor Car Company and the White Motor Car Company.

Marathon Builds—The Marathon Tire & Rubber Company, Cuyahoga Falls, O., is constructing a 65 feet by 300 feet building in which new machinery is to be installed as soon as possible. The company was recently organized for the purpose of manufacturing inner tubes and a general line of rubber goods.

Westinghouse Plant Increased—The Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa., has rented the first floor of a large building, and is installing machinery. The new plant will be used for the manufacture of automobile accessories and will employ 200 men and an equal number of women.

Philadelphia's Police Regulation—Automobile equipped with two pairs of lamps or lights must use only the less brilliant pair on streets with railway tracks and on Broad street and Diamond street and Twenty-first street within the district bounded by the Delaware and Schuylkill Rivers and Erie avenue and South street.

Ford's New Plant—The Ford Motor Company, Detroit, Mich., has opened up a new assembling and service department at Sixteenth street and Washington avenue, that city.

The Automobile Calendar

Shows, Conventions, Etc.

Nov. 16-25.....Atlanta, Ga., Annual Show, Auditorium-Armory, Atlanta Automobile and Accessory Association.
Jan. 2-10.....New York City, Importers' Salon, Hotel Astor, Importers' Automobile Alliance.
Jan. 4-11.....Cleveland, O., Annual Automobile Show.
Jan. 4-11.....Montreal, Que., Montreal Motor Show, Drill Hall and 65th Regiment Armory.
Jan. 11-25.....New York City, Thirteenth Annual Show, Madison Square Garden and Grand Central Palace, Automobile Board of Trade.
Jan. 20-25.....Philadelphia, Pa., Annual Automobile Show.
Jan. 22-25.....Geneva, N. Y., Annual Automobile Show.
Jan. 25-Feb. 1.....Montreal, Que., Automobile Exhibition, R. M. Jaffray, Manager.
Jan. 27-Feb. 1.....Buffalo, N. Y., Annual Automobile Show.
Jan. 27-Feb. 1.....Detroit, Mich., Annual Automobile Show.
Jan. 27 Feb. 1.....Ottawa, Ont., Ottawa Motor Show, Howick Hall, Louis Blumenstein.
Jan. 27-Feb. 1.....Scranton, Pa., Annual Automobile Show, Hugh B. Andrews.
Jan. 30-Feb. 1.....Canandaigua, N. Y., Annual Automobile Show.
Feb. 1-8.....Chicago, Ill., Annual Automobile Show.
Feb. 10-15.....Chicago, Ill., Truck Show.
Feb. 10-15.....Minneapolis, Minn., Annual Automobile Show.
Feb. 11-15.....Ottawa, Ont., Annual Automobile Show.
Feb. 12-15.....Geneva, N. Y., Automobile Show, Armory, Louis Blumenstein.
Feb. 15-22.....Newark, N. J., Annual Automobile Show, First Regiment Armory, New Jersey Automobile Exhibition Company.
Feb. 17-22.....Kansas City, Kan., Annual Automobile Show.
Feb. 20-22.....Canandaigua, N. Y., Automobile Show, Louis Blumenstein.
Feb. 24-Mar. 1.....Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association.
Feb. 24-Mar. 1.....Omaha, Neb., Annual Automobile Show.
Feb. 24-Mar. 1.....Paterson, N. J., Annual Show, Paterson Automobile Trade Association.
March 3-8.....Pittsburgh, Pa., Annual Automobile Show.
March 8-15.....Boston, Mass., Annual Automobile Show.
March 19-26.....Boston, Mass., Annual Truck Show.
March 24-29.....Indianapolis, Ind., Annual Automobile Show.

Race Meets, Runs, Hill Climbs, Etc.

Nov. 29-30.....Richmond, Va., Track Races, State Fair Grounds, Richmond Automobile Club.
May 30.....Indianapolis, Ind., 500-Mile Race, Speedway.

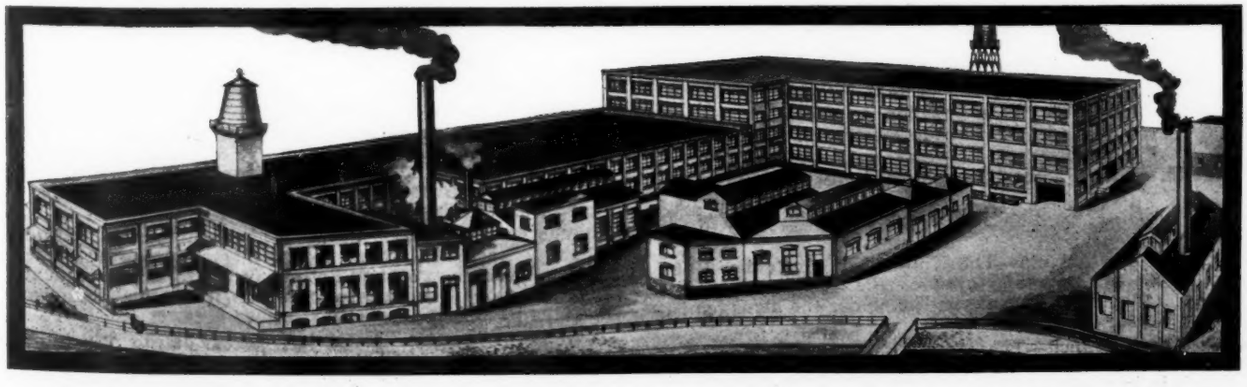
Proposed Contests

Nov. 23-24.....Track, Fresno, Cal., Barney Oldfield.
Nov. 28-29.....Track, Richmond, Va., Richmond Automobile Club.
Nov. 28.....Road Race, Visalia, Cal., W. H. Lipton.

Foreign

Dec. 7-22.....Paris, France, Paris Automobile Show, Grand Palais.
Jan. 11-22.....Brussels, Belgium, Annual Belgian Automobile Show, Centenary Palace.
March .....France, Sealed Bonnet 3000-Mile Run.
April .....Barcelona, Spain, International Exhibition.

The cars are sent from the factory to this department in a knocked-down condition, where they are assembled and sent to the various agencies. Besides the assembling room there are the general offices and a large stock room, where a complete stock of parts is carried.



View of the complete new plant of the New Process Raw Hide Company, Syracuse, N. Y., including the recent additions

Cartercar pay car used by the Detroit, Mich., department of public works. It saves time and precludes losing the pay rolls

PAID from Cartercar—By adopting a system of paying the Detroit, Mich., employees in the department of public works from the new city pay car, the city paymaster is able to save much time, and also eliminate any risk of losing the payrolls. The accompanying illustration shows part of a line of sixty men being paid off, the entire operation requiring only 10 minutes from the time the car enters the yards. The new car is the product of the Cartercar Company, Pontiac, Mich.

Delmore Opens Garage—E. J. Delmore, formerly with the Windsor, Ont., Hupmobile plant, has opened a garage in Reese, Mich.

Against Bulb Horn—Los Angeles, Cal., has just enacted an ordinance directed against the use of the bulb horn an as automobile warning signal.

Spare Succeeds Skilton—R. Y. Spare has succeeded R. J. Skilton as manager of the retail sales force of the Oldsmobile Company, Philadelphia, Pa.

Sullivan Alco Manager—The American Locomotive Company, Providence, R. I., has appointed G. L. Sullivan manager of the Chicago, Ill., branch.

Welch Manager Michigan—The Michigan Motor Car Company, Kalamazoo, Mich., has appointed E. A. Welch eastern sales manager, with headquarters in that city.

Fletcher Truck Manager—H. R. Fletcher has been appointed to take charge of the sales of the Flanders truck for the E. V. Stratton Company, Albany, N. Y.

Franklin Sales Conference—The annual conference of the district sales managers of the Franklin Automobile Company, Syracuse, N. Y., will be heid at the factory on November 21 and 22.

Buick Savannah Factory Branch—A factory branch of the Buick Motor Company, Flint, Mich., is to be established in Savannah, Ga. J. E. Finney will remain at the head of the concern.

Knight Tire in Atlanta—The Knight Tire & Rubber Company, Canton, O., manufacturer of the Knight tires, has opened a branch office in Atlanta, Ga., under the management of H. C. Ross.

Motz Opens Branch—The Motz Tire & Rubber Company, Akron, O., has installed a direct Boston, Mass., branch. M. A. Frank is in charge of this new branch, which is located at 4 Dundee street.

Durston Resigns—R. H. Durston has severed his connection with the Syracuse, N. Y., office of the American Cole Company and will in the future devote his time to an automobile business with J. Bowman.

Want Large Membership—An effort is being made by the Alabama Good Roads Association to swell its membership to 10,000. Speakers of the association will visit each county in the state during the winter to preach the doctrine of good roads.

Automobile in National Park—In order to take care of the tourist travel in Glacier National Park next year, A. Brewster, of Belton, Mont., has just purchased six Chalmers cars, which will make regular trips from Glacier Park station to St. Mary's Lake.

Richmond Show Association Formed—The Richmond Automobile Dealers' Show Association, Richmond, Va., organized for the purpose of conducting automobile shows and racing events in that city, has been chartered by the state Corporation Commission.

Wetmore at Y. M. C. A.—The opening of the tenth year of the West Side Y. M. C. A. automobile school occurs next Thursday evening, November 21, when J. C. Wetmore will speak on "The Chauffeur, a Potent Factor in the Advancement of the Automobile."

Drown with Steel Concern—J. W. Drown, formerly advertising manager of the Standard Roller Bearing Company, Philadelphia, Pa., has resigned and accepted a position as sales manager of the Pressed Steel Manufacturing Company, 504 Land Title Building, that city.

To Open Newark Salesroom—A new showroom in Newark, N. J., is soon to be opened. It is located on Halsey street and occupies nearly 20,000 square feet of floor-space. The enterprise is headed by Messrs. Dalley and Van Vleck, who will handle the Touraine Six.

Cumberland's $40,000 Garage—The Cumberland Motor Company, Nashville, Tenn., is erecting a garage and sales room at Fifteenth street and Broadway, the total cost amounting to $40,000. The salesroom which fronts on Broadway will extend 100 feet across and 40 feet deep.

A Modern Garage—The modern garage is the title which Philo C. Fuller, of Grand Rapids, will confer upon the $85,000 automobile palace which he is now erecting. The structure will be of Spanish architectural type, with a three-story angle and one-story wings. It will be 140 feet by 100 feet in size.

New Agencies Established During the Week

PLEASURE CARS

Place	Car	Agent
Attleboro, Mass.	Metz	W. B. Hollander
Bartlesville, Okla.	Moon	Cherokee M. C. Co.
Blockton, Ia.	Hupmobile	Asa Terrill
Boston, Mass.	Havers	Hoyt Carbureter & Auto Co.
Bridgewater, Mass.	Overland	H. C. White
Brockton, Mass.	Little	Fisher-Nickerson Co.
Buffalo, N. Y.	Pullman	Auto Sales Co.
Charlotte, N. C.	Oakland	Model Garage
Cincinnati, O.	Alco	Peters & Keating
Cleveland, O.	Alco	Maurice Rohrheimer
Columbus, O.	Empire	W. W. Schott & Co.
Columbus, O.	Metz	D. W. Short
Council Bluffs, Ia.	Studebaker	T. A. Mitchell
Craig, Ia.	Moon	The Craig Auto Co.
Davenport, Ia.	Michigan	R. Altendorf
Denver, Colo.	Michigan	F. P. Sevier
Dixon, Neb.	Mason	R. Paul
Greenville, O.	Overland	Swope Music & Auto. Co.
Harrisburg, Ill.	Moon	C. V. Parker
Jacksonville, Fla.	Alco	Wiesenfeld Warehouse Co.
Joplin, Mo.	Moon	Joplin Supply Co.
Leesville, S. C.	Oakland	H. A. Meetz
Little Falls, N. Y.	Franklin	F. F. Stacey
Little Rock, Ark.	Oakland	C. L. Hoffman
Louisville, Ky.	Packard	Southern Motors Co.
Long Meadow, Mass.	Havers	C. W. North
Los Angeles, Cal.	Moon	L. C. Buxton
Lowell, Mass.	Little	Lowell Auto. Co.
Lowell, Mass.	Oakland	Lowell Auto. Co.
Macon, Mo.	Moon	Macon Garage Co.
Mediapolis, Ia.	Moon	Fleenor's Garage
Miami, Fla.	Alco	Chas. Jones
Minneapolis, Minn.	McIntyre	MacArthur, Zollass, Thompson Co.
Montclair, N. J.	Moon	Montclair Garage
Montreal, Que.	Cole	Royal Auto. Co.
New Orleans, La.	Haynes	Demack Motor Car Co.
Philadelphia, Pa.	Havers	V. P. Dadula
Portsmouth, O.	Ford	W. J. Friel
Portsmouth, O.	Mitchell	R. S. Pritchard
Portsmouth, O.	Paige-Detroit	Portsmouth Auto. & Mach. Co.
Providence, R. I.	Metz	W. B. Hollander
Regina, Sask.	Franklin	Regent Motors Lit.
Rosalie, Neb.	Mason	T. Lake
San Francisco, Cal.	Fiat	Dwight Whiting
Savannah, Ga.	Oakland	J. J. McDonough, Jr.
Seattle, Wash.	Havers	R. H. & H. C. Gray
Sidney, Neb.	Franklin	McIntosh & Brewer
Springfield, Mass.	Mitchell	R. A. McKee
St. Matthews, S. C.	Oakland	Banks Auto. Co.
St. Paul, Minn.	Pope-Hartford	Fosnes, Saterlee, Babcock Co.
Superior, Neb.	Hupmobile	L. R. Kesterson
Syracuse, N. Y.	Alco	Jefferson Gar. Co.
Syracuse, N. Y.	Havers	James Auto Co.
Tampa, Fla.	Alco	Chas. H. Moorhouse
Toledo, O.	Imperial	Cornelius & Hohly
Valley, Neb.	Studebaker	Johnson & Clark
Wilmington, N. C.	Oakland	H. L. Fennell

Motor Train Service—The Chicago, Terre Haute and Southeastern Railway Company has established motor train service between Terre Haute and Dana, Ind.

Annapolis Boulevard Completed—The Annapolis boulevard between Boone and Revelle has been completed so that now there is a continuous stretch of boulevard from Brooklyn to Annapolis.

Chase Manager The Falk Company—C. F. Chase has been appointed sales manager of the gas engine department of The Falk Company of Milwaukee, Wis., which also manufactures a kerosene gas engine.

Cool Pathfinder Manager—H. G. Salisbury, recently appointed general manager of the Pathfinder Motor Car Company of California, has appointed Barry Cool manager of the San Francisco branch.

Ijams in Chicago—R. L. Ijams, assistant to C. A. Gilbert, western district manager of the United States Tire Company, has been transferred to the central district under J. C. Weston with headquarters in Chicago, Ill.

Kingsford Leaves Peerless—Mr. Russell T. Kingsford has resigned his connection with the Peerless Motor Car Company, Detroit, Mich., to accept the position of chief engineer with the Rushmore Dynamo Works, Plainfield, N. J.

Perkins with Rushmore—Mr. J. Perkins, for several years superintendent of the Saurer motor truck factory of the International Motor Company at Plainfield, N. J., has resigned his position there, to become superintendent of the Rushmore Dynamo Works, Plainfield.

Small Resigns—Allen H. Small, assistant manager of the Milwaukee, Wis., branch of the Buick Motor Company for some time, has resigned to accept the position of district manager for the Oakland-Wisconsin Motor Company, state agent for the Oakland, Empire and Detroiter.

Reavell Manager Diamond—O. C. Reavell has been transferred to the management of the Indianapolis branch of the Diamond Tire and Rubber Company, Akron, O. He succeeds H. W. Fauvre, who has been advanced to manager of the company's Chicago, Ill., sales and distributing branch.

Wants Motor Trucks—Commissioner Edwards of Salem, Mass., who has charge of the street cleaning department, plans to request the board of aldermen to make an appropriation for 25 motor trucks to be used as garbage wagons to take the place of the horse-drawn vehicles now in use.

Highway Commission Inspection—The members of the Massachusetts Highway Commission started recently on their annual inspection of the roads and bridges of the Bay State and before they finish they will have visited 320 towns and 33 cities. They are making the run in a Locomobile.

Stewart Traveling Representative—Roy D. Stewart, formerly mechanical manager of the Milwaukee, Wis., branch of the Thos. B. Jeffery Company, and more recently manager of the Walsh & Schulz garage, has resigned to become Wisconsin traveling representative of the Vacuum Oil Company.

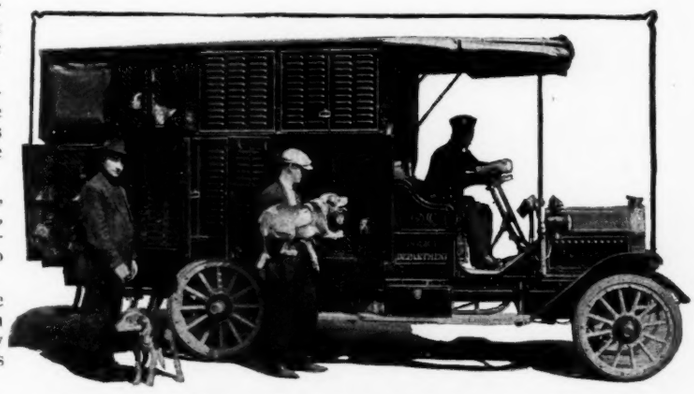
Walker Makes a Change—Warren T. Walker, formerly with the Locomobile and Matheson branches in Boston, Mass., has been appointed manager of the Boston branch of the Kelly-Springfield tire company, succeeding Manager Beach, who has been sent to take charge of the San Francisco, Cal., branch.

Highway Construction Completed—An interesting piece of highway construction known as the Rincon sea-level cut-off has just been completed. The road saves 9 miles between Ventura and Santa Barbara, Cal., and eliminates the dangerous Casitas Pass, with its climb of 1,200 feet and its dangerous and narrow roads.

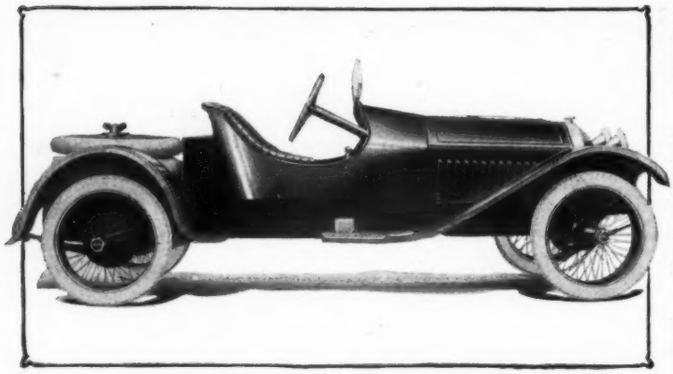
Cadillac Moves—The Jonas Automobile Company, representing the Cadillac, has moved into its new home, the Cadillac Building, Milwaukee, Wis. The former quarters at 417-421 Wells street are now occupied by the Wolleager Auto Sales Company, successor to the Milwaukee branch of the Studebaker Corporation.

United Tire's Agencies—The United States Tire Company has recently opened new sub-branches in Newark, N. J.; Birmingham, Ala.; Rochester, N. Y.; Washington, D. C., and Milwaukee, Wis. In the near future sub-branches also will be opened in Providence, R. I.; Worcester, Mass.; Baltimore, Md.; Syracuse, N. Y., and in Columbus and Toledo, O.

Cadillac Breaks Record—The Los Angeles-San Francisco, Cal., record over what is known as the valley or inland route, one of the road classics of California, was broken recently by a 1913 Cadillac, driven by Charles Soules, the former racing driver. The distance is close to 500 miles, and the Cadillac negotiated the run in 17 hours and 5 minutes. This time breaks the old record by 40 minutes.



The latest addition to the Detroit fleet of municipal trucks is a G.M.C. dog catcher's wagon. The vehicle is operated under the direction of the Detroit police department and is impounding on the average of ninety muzzleless canines per day. The new wagon is designed to carry the dogs in the most humane manner possible. Fourteen cages of various sizes are provided and whenever it is necessary, a vicious dog may be kept apart from the others in a separate compartment



One of the new Oakland models, the six-cylinder, 60-horsepower two-passenger roadster

Wilder in New Rooms—The Wilder Motor Car Company is now occupying its new salesroom in Louisville, Ky.

Robartes Locomobile Manager—F. W. Robartes has been appointed manager of the Washington, D. C., branch of the Locomobile Company, succeeding James J. Flynn.

Savannah Run on Thanksgiving—Preliminary arrangements for an automobile run on Thansgiving Day are being perfected by the Savannah Automobile Club, Savannah, Ga.

Goodloe Atlanta Manager—T. B. Goodloe, who has been in charge of the Richmond, Va., sub-branch of the United States Tire Company, has been appointed manager of the Atlanta, Ga., branch of the same organization. Mr. Goodloe is succeeded in Richmond by J. G. Given.

Prest-O-Lite in Portland—The Prest-O-Lite Company, Indianapolis, Ind., recently opened a factory branch in Portland, Ore., and word has now just been given by H. H. Van Horn, who will have management of the branch, that the Searchlight Gas Company of Chicago, Ill., will establish its northwest branch in Portland.

Garage Cost $30,000—John B. Hauf, of Albany, N. Y., is having constructed in that city a garage and storehouse. The dimensions of the new building are 110 feet by 44 feet; its cost is to be about $30,000. The new building will be absolutely fireproof, consisting of four stories, the first two being for the garage.

Sager Selected—The Cadillac Motor Car Company, and the Packard Motor Car Company, both of Detroit, Mich., have selected the Sager Diamond Bumper, made exclusively by the J. H. Sager Company, Rochester, N. Y., who have been granted letters patent covering both mechanical and ornamental design.

Clearing House Success—When the automobile clearing house was first formed in Seattle, Wash., it was with the idea of keeping it going not more than a month, but owing to the wonderful success of the venture it has been made a permanent institution on automobile row and it bids fair to be one of the largest automobile concerns on the Pacific Coast in a year's time.

Kurtz Retires—E. W. Kurtz has announced his retirement from the position of director of advertising for the General Motors Company, Detroit, Mich., the work and purpose of the advertising department of the General Motors having been accomplished. This department at the general offices has been discontinued, each individual plant now having its own publicity and advertising department.

Frisco Selling Organization—A new kind of automobile selling organization is being tried out in California and is being watched with a great deal of interest by San Francisco dealers. The organization is known as the Mutual Motor Agencies of Northern California, and is composed of small automobile concerns organized for the special purpose of pushing a popular-priced automobile on the market.

Lamb-Daniel Company Formed—H. A. Daniel, formerly purchasing agent of the Carter Car Company, Pontiac, Mich., and J. J. Lamb, a local advertising man, are the principal figures in a newly formed concern in that city to be known as Lamb-Daniel & Company, with headquarters in the Union Trust Building. The new firm will act as manufacturers' representative for several Detroit automobile parts manufacturers.

Convicts Construct Automobile—Convicts at Sing Sing prison, New York State, have completed the construction of an automobile with exception of the engine, which was purchased from a motor dealer. Commissioner Edwards of the street cleaning department of New York City will inspect the machine and if satisfactory it will be purchased and installed in the street cleaning department of the metropolis at a cost of $5,000.

San Joseites Organize—At the beginning of October a number of the automobile enthusiasts of San Jose, Cal., organized a motor club in that city. Within 2 weeks they secured a membership of 275, raised $45,000 actual cash, have purchased 90 acres of Toothill land near Alum Roçk, and have let a contract for an extensive club house and the laying out of extensive grounds. The officers are: W. S. Clayton, president; John R. Chance, secretary; Albert Bettins, treasurer.

Minneapolis Busy Building—Three automobile buildings are being constructed in Minneapolis, Minn., for Andersch Brothers, Abbott-Detroit, to cost $35,000; for The Colby Motor company, to cost $10,000 and for the Bowman & Libby, Inc., Overland, and the Goodyear Tire & Rubber company, to cost $100,000. The Ford Motor company will erect a $200,000 building and the Avery company, Peoria, Ill., has bought a site for an implement and automobile building.

Dayton Tire Suit—The Victor Inner Tire & Rubber Company, Dayton, O., is the defendant in a recently filed suit in the United States District Court brought by Cecil Adamson, East Palestine, O., who alleges that the concern has infringed on a patent on improvement in tire vulcanizing repair apparatus. He asks $5,000 damages, an accounting and an injunction restraining the defendants from further infringement on his patents. J. Everett Inman and George Inman are named in the suit.

Washington Company's Troubles.—An involuntary petition in bankruptcy has been filed against the F. K. B. Company, Washington, D. C., automobile supplies, at 1110-1112 Fourteenth street, N. W., by the Continental Rubber Company, R. E. Dietz Company and the Commercial National Bank of that city, whose claims aggregate $12,000. The assets are said to be about $7,000. The bankruptcy court awarded adjudication, referred the case to a referee in bankruptcy and appointed Wilton J. Lambert and L. P. Loving receivers under a bond of $10,000.

Wisconsin Expends $950,000—A review of the highway situation in Wisconsin at this time presents a most satisfactory state of affairs. During the past year approximately $950,000 has been expended in permanent highway improvement and the estimates for next year, based on the demands of the counties for state aid, are in excess of $1,750,000. The report of A. R. Hirst, chief engineer of the Wisconsin State Highway Commission, shows that the counties are asking $811,150 from the state for permanent work in 1913, as compared with $453,417 demanded for 1912 work. Engineer Hirst's report shows that about 35 miles of concrete road were constructed during the closing season. The average cost is 90 cents per square yard.

Automobile Incorporations

AUTOMOBILES AND PARTS

AUBURN, IND.—De Sota Motor Car Company; capital, $20,000; to manufacture automobiles. Incorporators: L. M. Field, Hayes Fry, Glenn Fry, V. Van Sickle, H. J. Clark.

CHICAGO, ILL.—Keeton Motor Company; capital, $60,000; to manufacture automobiles and accessories. Incorporators: L. C. Roberts, K. R. Roberts, W. C. Spenny.

CLEVELAND, O.—Auto Mart Company; capital, $10,000; to deal in and rent automobiles. Incorporators: Edward C. Plietz, W. L. Radcliffe, William H. Hasselman, William R. Wallace, Louis C. Heimberger.

CLEVELAND, O.—Hall-Miller Auto Company; capital, $5,000; to deal in automobiles of all kinds. Incorporators: Joseph A. Freund, Jr., A. M. Freund, L. Greenfield, Charles Kovanda, J. A. Freund.

CLEVELAND, O.—Motor Mechanism Company; capital, $25,000; to manufacture automobiles and parts. Incorporators: Edward Younger, Florence Castle, Herbert O. Evans, H. E. Gray, S. E. Sackerman.

CLEVELAND, O.—Northern Ohio Motor Company; capital, $25,000; to deal in automobiles. Incorporators: Herbert W. Bell, E. L. Benning, F. C. Anselm, E. P. Elrich.

DANBURY, CONN.—Fillow Auto Company; capital, $30,000; to manufacture automobiles. Incorporators: A. Homer Fillow, Joseph W. Juengst, B. M. Fillow.

INDIANAPOLIS, IND.—Hunter-Hammond Auto Company; capital, $12,000; to manufacture automobiles and accessories.

NEW YORK CITY, N. Y.—Foreign & Domestic Automobile Repair Company; capital $10,000; to manufacture automobiles. Incorporators: L. O. Rothschild, Otto A. Deffea, Max Kaplan.

NEWARK, N. J.—Van Deman & Wainwright; capital, $50,000; to conduct a general automobile business. Incorporators: A. J. Thurstans, W. A. Waters, J. Rose.

TORONTO, CAN.—Standard Garage, Ltd.; capital, $40,000; to manufacture automobiles. Incorporators: Samuel W. Marchment, Harold W. Marchment, Douglas L. Berwick.

Ayers in Charge—J. C. Ayers has taken the managership of the General Motors Truck Company's Detroit branch.

Clement Production Manager—C. M. Clement has become production manager of the Metal Products Company, Detroit, Mich.

Somerville Sales Manager—W. A. Somerville has taken the position of sales manager of the Stromberg Motor Devices Company, Chicago, Ill.

Addition to Ford Branch—Ground has been broken for the new addition of the Ford Auto Company, Baltimore, Md., which is to join the present building.

Losey Buick Manager—R. H. Losey, formerly of Indianapolis, Ind., has been named manager of the Atlanta, Ga., branch of the Buick Motor Company.

Flynn Resigns—James J. Flynn has resigned as manager of the Washington, D. C., branch of the Locomobile Company. His successor has not yet been appointed.

Ong Office Manager—The Sterling Auto Company, Detroit, Mich., has engaged D. G. Ong, former paymaster of the Flanders Motor Company, as office manager.

Municipal Garage for Providence—The work of motorizing the municipal department of Providence, R. I., has progressed so far that a municipal garage has been established.

Jenkins With Abbott—W. M. Jenkins, former sales manager of the Simplex Motor Car Company has become Pacific Coast representative of the Abbott Motor Company.

Albany's Parade—Albany, N. Y., had an automobile parade recently. Headed by a band on a Mack truck the column assembled at Central avenue and Northern boulevard.

Franklin Dealer Moves—The H. J. Mich Auto Company, Minneapolis, Minn., Franklin dealer, has moved into a new salesroom and service station at 1400 Hennepin avenue.

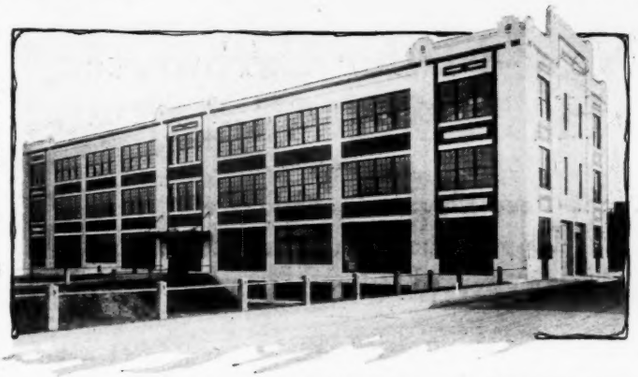
Secoir with Studebaker—Carl J. Secoir, purchasing agent at the Havers Motor Car Company, Port Huron, Mich., has joined the forces of the Studebaker Corporation, Detroit, Mich.

KisselKar Branch Moves—The Boston branch of the KisselKar Company moved recently from the Motor Mart into the new building just completed for the branch on Commonwealth avenue.

Wilcox Gives Dinner—The H. E. Wilcox Motor Car Company, Minneapolis, Minn., gave a dinner at the Kaiserhof during Made in Minneapolis Week, for 125 drivers of Wilcox trucks in that city.

New Oakland Branch—The Oakland Motor Car Company has opened a new branch at Houston, Texas, with A. J. Challinoir in charge. Mr. Challinoir was formerly connected with the factory at Pontiac, Mich.

Buys Gasoline Cars—The Northern Central Railway has purchased eight gasoline motor cars for use in its maintenance of way department on the Columbia and Frederick branch between Columbia, Pa., and Frederick, Md., a distance of 68 miles.



New sales and service building of the Thomas B. Jeffery Company in Boston, Mass.

Maus Joins U. S. Tire—John B. Maus has joined the United States Tire Company's selling forces in the capacity of special assistant to O. S. Tweedy, eastern district manager. Mr. Maus will have his headquarters in New York.

To Handle Great Western—The Great Western Auto Sales Company has been formed in Indianapolis, Ind., by C. E. Williams and J. E. Williams and will distribute the Great Western line of cars in Indianapolis and vicinity.

Nakes Chosen President—At the annual meeting of the Albany Automobile Dealers Association, Albany, N. Y., held in the office of the Dominant Motor Car Company, Chauncey D. Nakes, of Albany Garage, was chosen president.

New Home for White Company—The White Company has purchased more than an acre of land on Commonwealth avenue, Boston, Mass., next to the new KisselKar building, on which will be erected a salesroom and service department.

Baltimore Franklin Moves—The Baltimore branch of the Franklin Automobile Company, Baltimore, Md., has moved into new quarters at 1919 N. Charles street, and a thoroughly up-to-date service station has been established at the new address.

Motz Changes to Branch—The Motz Tire & Rubber Company has changed its line in Boston, Mass., formerly handled by the Standard Tire & Rubber Company as an agency proposition to a factory branch with M. A. Frank as manager and headquarters at 4 Dundee street.

Cobb Is Manager—A. M. Cobb, formerly manager of the Thomas branch, Chicago, Ill., has succeeded to the position of manager of the Velie branch left vacant by the retirement of Morton H. Luce, who goes to New York representing the Marion and American. George L. Sullivan, of New York, has been appointed manager of the local Alco branch in place of B. C. Day.

Baker Sales Show Increase—The sales increase in the pleasure car department of the Baker Motor Vehicle Company, Cleveland, O., for October, 1912, shows a net gain over October, 1911, of 123 per cent. This is 36½ per cent. higher than the total sales for April, 1911, which marked previously the greatest monthly volume of sales in the history of the Baker Company.

Haynes' New Alloy—Elwood Haynes of the Haynes Automobile Company, Kokomo, Ind., was the principal speaker at a meeting of the Indiana branch of the American Chemical Society held in Indianapolis one night recently. Mr. Haynes explained a new alloy which he recently discovered, and which he believes will revolutionize the manufacture of surgical instruments and hard metal tools.

Vehicle Club Election—The Electric Vehicle Club, of Boston, held its annual meeting at which plans for reorganization were discussed. The organization committee was instructed to prepare a constitution and by-laws for presentation at the next meeting. The following officers were elected: Day Baker, president; E. S. Mansfield, vice-president; H. S. Thompson, secretary; J. S. Codman, treasurer.

Rochester Club Elects—At the annual meeting and election of officers of the Rochester Automobile Dealers Association, Rochester, N. Y., Frank W. Peck was unanimously re-elected president, while C. E. Hartson was chosen again for vice-president. George J. Bauer was elected secretary. A. F. Crittenden, who has withdrawn from the automobile business, resigned from the treasurership and was succeeded by F. R. Luescher.

Automobile Incorporations

GARAGES AND ACCESSORIES

BIRMINGHAM, ALA.—Alabama Tire Repair Company; capital, $15,000; to repair automobile tires. Incorporators: J. E. Kennedy, Al C. Garber, P. B. Brown.

CHICAGO, ILL.—Abbey Auto Livery Company; capital, $2,500; to conduct a general automobile and garage business. Incorporators: George W. Waterman, John K. Lenox, Clara A. Blackwell.

NEWCASTLE, IND.—Rose City Auto Company; capital, $10,000; to conduct a general sales agency and garage. Incorporators: Frank E. Smith, Charles W. Mouch, William F. Byrkey, Howard M. Van Matre, Gordon Cameron, Lawrence Bailey, Albert D. Ogborn.

PHILADELPHIA, PA.—M. S. H. Sales & Rubber Company; capital, $10,000; to deal in automobile tires and mechanical rubber goods. Incorporators: Frank A. Harrigan, J. V. Harrigan, Robert J. Skilton.

RACINE, WIS.—Racine Auto Tire Company; capital, $75,000; to manufacture pneumatic tires. Incorporators: L. J. Elliott, C. Wright, M. E. Walker.

RALEIGH, N. C.—Reitzel Automobile Service Company; capital, $25,000; to conduct an automobile service station. Incorporators: O. C. Klingman, J. H. Reitzel, L. G. Klingman.

RICHMOND, KY.—Madison Garage; capital, $2,000; to conduct a general garage business. Incorporators: Roy Montgomery, Frank E. Chase, M. C. Kellogg.

SHELBYVILLE, KY.—Fawkes, Pulliam & Graham; capital, $3,300; to conduct a general garage business. Incorporators: E. B. Graham, George Fawkes, Harry Pulliam.

TOLEDO, O.—Toledo Auto Shows Company; capital, $10,000; to conduct an automobile show. Incorporators: J. W. Banting, A. A. Atwood, H. W. Blevins, Guy R. Ford.

CHANGES OF NAME AND CAPITAL

DAYTON, O.—Heathman Soliday Motor Company; name changed to Frank B. Heathman Motor Company.

New-Miller Carbureter Has Three Adjustments

Float-Feed Device Incorporates Many Novel Features—Interconnected Throttle and Air Valves

New and Ingenious Tools Used in Making Product Which Can Be Turned Out at Rate of 400 Per Day

A NEW style carbureter has been brought out by the New-Miller Manufacturing Company, which is worthy of attention because it involves several new and seemingly exceptionally desirable features. One of the greatest advantages of this carbureter would appear to lie in the fact that the gasoline level is co-incident with the fuel level. On most concentric-float carbureters the fuel level has been about .06 inches below the jet nozzle. As a consequence of this it is generally necessary to flood the carbureter by priming before starting the motor in cold weather. Other features which are noteworthy are the modified venturi which in this case is merely a constriction in the air passage in the neighborhood of the jet; the interconnection of the auxiliary air and the throttle, high, low and intermediate speed adjustments, free float; connection of throttle to needle valve; taper on needle valve corresponding to air port area and accurate idling adjustments.

Fig. 1 shows the interior of the New-Miller carbureter, a quarter section being cut out on the line of the needle. Through the design of this carbureter, the makers claim it is possible to bring down the vacuum in the manifold to the relative minimum, and, at the same time, take in the charge in such a way that it will not be deflected to either wall of the carbureter or manifold. To accomplish this, the auxiliary air is taken through an annular intake just enough air being taken through the normal to lift the gas out of the vacuum cup in the top of the nozzle.

The throttle butterfly D is connected with a toggle to a piston that travels over the ports for the auxiliary air. The throttle butterfly is also connected to the needle valve. Every movement of the throttle B has a corresponding movement of the air piston and the needle. In order to give a greater throttle range, the wall around the butterfly is cut on a radius. This gives a much greater range than is possible with the ordinary straight walled carbureter.

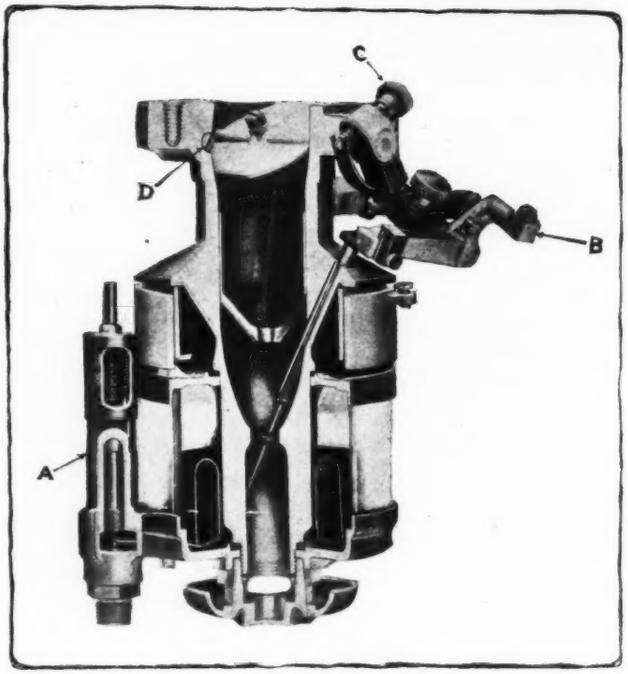


Fig. 1—Quarter section through the New-Miller carbureter showing construction

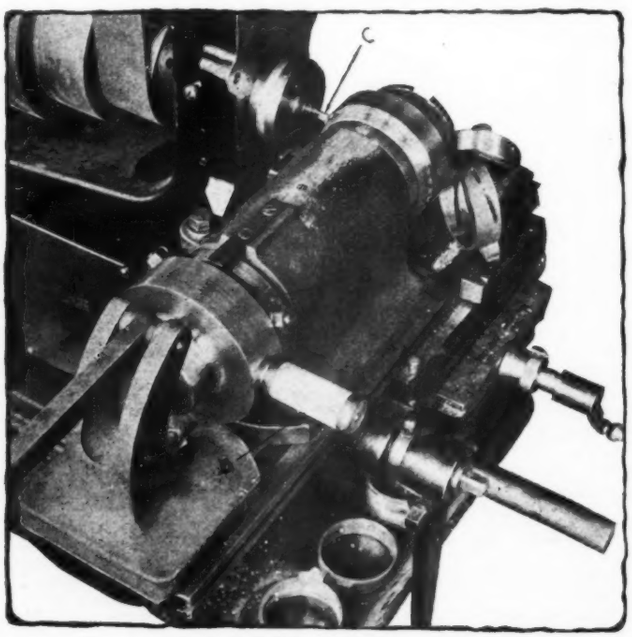


Fig. 2—View of slotting tool especially designed for the New-Miller carbureter

The action of the New-Miller carbureter is entirely mechanical, so that the motor, if turning over 1,500 or turning over 300, will receive the same percentage of air and gas at all times. By having the auxiliary air piston connected to the butterfly, it is possible to give the motor a long, hard pull until you have decreased your speed to such an extent that it is necessary to release your clutch and shift gears without loading the manifold.

New-Miller carbureters are all equipped with copper floats, which float free, suspended in the gasoline, until the motor stops, at which time it locks the gasoline. The ordinary method of tilting the butterfly to the proper angle to secure low speed is entirely done away with in this carbureter. The butterfly has one side milled out, and there is inserted in the body of the carbureter at the center of the radius cut for the butterfly a quarter-inch round brass rod with a radius milled on the inside to match the radius of the carbureter. This can be turned down until it will completely close the milled portion of the butterfly or opened to admit just enough gas to secure low speed.

Another advantage claimed by the makers is that it is never necessary to prime, as the float level of the gasoline is the same as the top of the nozzle, or the vacuum cup in the nozzle. To take care of different temperatures and the constant varying grade of gasoline the needle can be raised or lowered from the seat, thereby changing the diameter of the needle in the nozzle while the car is running or standing idle to any desired size and overcoming on the instant any difficulties of this kind.

The New-Miller carbureter has been tooled up to make the parts absolutely interchangeable in five sizes and they are designed for a quantity production of something over 400 daily. Some of the tools for this carbureter are unique in their design. They have been designed by O. L. Snyder, engineer and designer of all the tools in the New-Miller plant.

Fig. 2 shows the cam tool C, for milling the slots in the side of the air sleeve, one of these sleeves standing at the head of

Fig. 3—Rear view of tool used in slotting cams for the New-Miller carbureter

this tool showing the slot on each side of the sleeve cut to the proper angle. All sleeves are cut on the same degree but with different travels. This tool is also shown in Fig. 3. In Fig. 2 the index head is shown. This index head has two zero marks at exactly 180 degrees. The head is graduated from each zero mark 90 degrees on either side. The lock stops B are set either side of the zero mark to the graduation. On the inside of this case are two master cams fitting into each other, with a 12-degree pitch. The index head is fastened onto a shaft running through the center, the first cam being fastened to the casing, the other being known as the free cam. This shaft running through connects with the head on the back end holding the handle D. This handle is used not only for throwing the work, but for releasing the free cam underneath. When the work is set, stops 1 and 2 are set to the degrees on the index head. The cutter C is turned through the material, and the stop is released and the work thrown over to the opposite stop, when the same operation is performed on that side. It is possible to turn out one of these cams completed every 32 seconds or about 1,000 per day.

Fig. 3 shows the weights that are used in holding the free cam in against the stationary cam.

Fig. 4 shows what is known as the radius tool. This is for cutting the radius in the body for the travel of the butterfly. The cutting edge of the tool is set on the same radius as the cut in the body, the turret being moved up to the stop and the lever used to carry the tool through the work. This tool has a capacity of about 40 carbureters every hour, and there are five of these in operation.

To adjust the New-Miller carbureter, run auxiliary air sleeve up and leave wide open; after you have made all your connections for gasoline, leave the throttle closed, turn on your gasoline and adjust your float level nut, the knurled nut above A, Fig. 1, so that the gasoline is even with the mark on the stem marked float level. Never above mark. The mark A is at the same level with the top of nozzle. You then start your motor to running with the throttle still closed. If steering-post adjustment is used, remove nozzle screw; knurled nut above cam B. Now raise the cam B forward till engine runs smoothly. It is never necessary to prime this carbureter in starting, as the gasoline is always level with the nozzle.

Next adjust the intermediate speed by running the little screw between B and the knurled nut just mentioned, back or forward until the wheel on the roller is about in the position shown in Fig. 1. You can now open your throttle, and adjust the high, by turning to the left which will give you more gas, or by turning to the right, which will cut the gas down.

The intermediate speed is simply an adjustment for your motor to take the high speed a little quicker and for you to ride on intermediate speed with your throttle part-way open, with more or less gas, according to the conditions of the country in which you are driving. The farther out the little wheel is run on the track, the more gas you will have at intermediate speed and the quicker you will take your high on throwing open the throttle. When your high is adjusted properly, you can close the throttle, and the low speed for idle running is seen in Fig. 1, D.

By inserting a screwdriver in the slot D you can turn this to the right until the motor is running as slow as it is possible to get it. You are running then on the idle speed, with nothing but gasoline and what air comes in through the normal opening. When these adjustments are once set, it is never necessary to change them, no difference what the condition of the weather or the grade of the gasoline.

It is the contention of the New-Miller Carbureter Company that in the winter time, when gasoline is very hard to vaporize and when the grade of gasoline goes down, as it does every day, the proportion of air to gasoline must be maintained the same as in warm weather and for a high grade of gasoline, and to do this, the only way feasible is to increase the supply of gasoline. This is accomplished by the steering-post adjustment.

Fig. 1 shows the little cam riding on the lever, and by moving it to the right the needle is allowed to lift out of the nozzle, increasing the diameter of the nozzle thereby. The bottom of the stem of the needle has a taper at the point of entering the nozzle, and on the end of the needle has three butterflies. By lifting the needle the size of the orifice is varied in this nozzle according to how far the taper is taken out of the nozzle or driven down in. In other words, it is possible to put in the smallest needle that is practicable, or increase it to the largest practicable by simply adjusting the steering-post control. The proportions on high, intermediate and low remain just the same under all conditions.

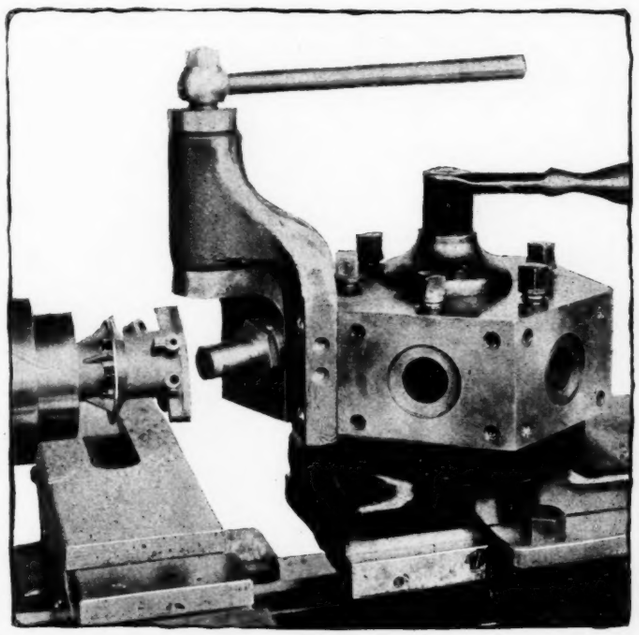


Fig. 4—Tool for cutting radius in body for the travel of butterfly valve

Viso Spark-Plug; Saunders Fuel Saver; Ford Electric Headlights; Seat Covers for Ford Cars; Burke Work-Saving Inflation Valve; Fuel Consumption Gauge; Azadian Indicators; Automobile Gasoline Lock

THE tendency to keep the user of an automobile well informed as to the working of its various parts is well illustrated by the increasing number of spark-plugs equipped with visible-gap features. The latest product developed along these lines is the Viso plug, Fig. 1, made by the Rapp Mfg. Co., Toledo, O. This plug is of conventional exterior, but has two distinguishing features, namely, the visible spark-gap and the adjustability of the jump gap between the two firing points. The visible spark-gap is formed between the top end of the positive electrode and a short point shaped at the lower end of the terminal screw; these two ends are held in a glass insulation which is surrounded by a metal coat resting on the porcelain insulation. By turning the metal coat of the glass, the positive or central electrode which screws in a threaded bearing, may be screwed up or down, thereby varying the distance between it and the electrode formed on the shell. The porcelain is formed without any holes or cavities, to prevent the formation of deposits therein. The spark-plug is made in the standard sizes and porcelain and shell are interchangeable.

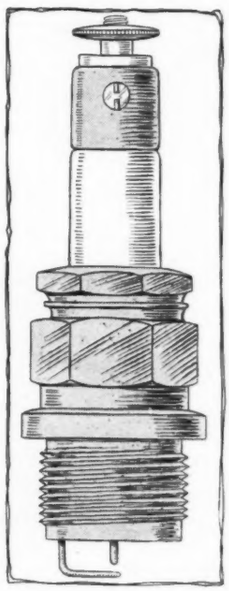


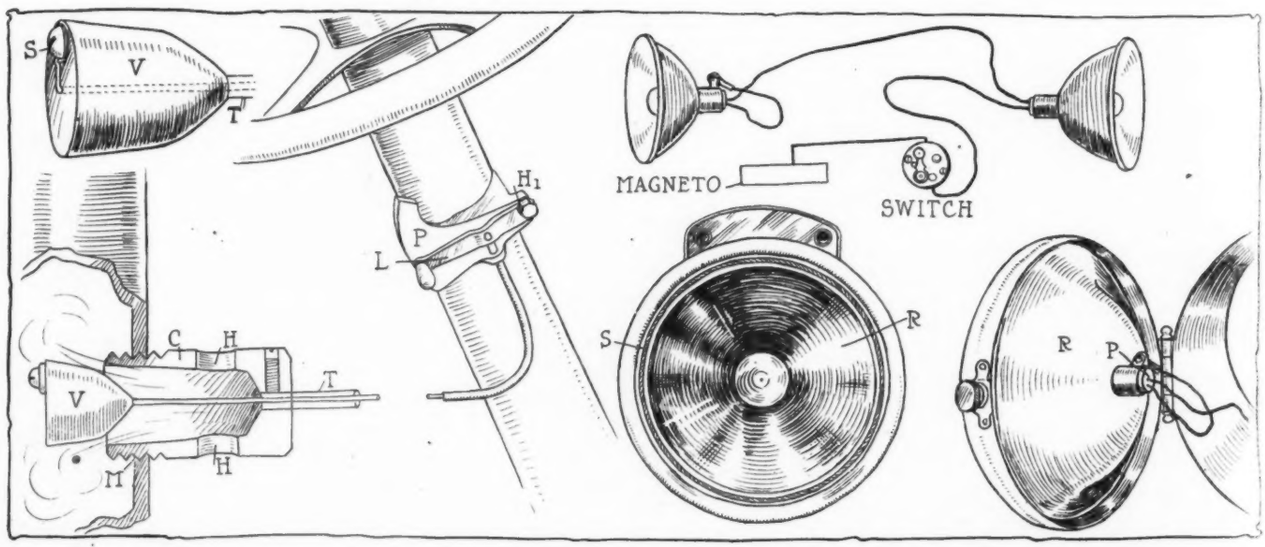
Fig. 1—View of the Viso spark-plug, which is equipped with a visible spark-gap and adjustable central electrode

Electric Headlights for Fords

The Motor Car Equipment Company, 55 Warren street, New York City, has recently constructed an electric lighting outfit for Ford cars, Figs. 4 and 5, which consists of a pair of parabolic reflectors fitting into the acetylene lamps furnished with Ford automobiles. In the apex of each reflector is fitted a socket P equipped with connections through which current may be furnished to a bulb B. The reflector R of each lamp is silvered on its concave surface, and the bulb is positioned practically in the focus of the parabola, so that all light is emitted in the shape of a parallel beam. To keep the lens from being scratched the front edge of the reflector is faced with a strip S of white soft material. The wires enter the lamp through the hole in which the acetylene burner is ordinarily mounted. The method of connecting the lamps is shown in the scheme, Fig. 4. The Ford magneto, which is mounted in the flywheel and generates sufficient current to supply a set of lights, is used as the source of electricity.

Saunders Gasoline Saver

To utilize to its fullest extent the gasoline consumed by the motor, the Leslie R. Saunders Company, 927 West Seventh street, Los Angeles, Cal., has evolved the Saunders gasoline saver, Figs. 2 and 3, which is simply a device for supplying auxiliary air to the mixture flowing from the carbureter to the manifold. It consists of a 1.5-inch brass cylinder C, Fig. 2, formed with four air holes H and fitted into a threaded hole M in the intake manifold, thus presenting a pasage from the exterior atmosphere to the interior of the manifold. This passage, however, is ordinarily closed by a conical valve-plug V which, like the cylinder C, is made of brass and exactly fits the inner end of C, thus closing the hole M. Through the apex of C enters a Bowden wire, which passes all the way through V and is fastened by the screw S, while its other end is connected to a small operating lever fixed to the steering column as shown in Fig. 3. The wire is conducted through a tube T leading from the steering column to the manifold, and as the Bowden wire is practically incompressible, a slight movement of the lever unseats the valve V, permitting of air being drawn in through H and M, due to the suction in the intake manifold. The method of fastening the operating lever to the



Figs. 2 and 3—Saunders gas saver and operating mechanism. Figs. 4 and 5—M. C. E. Company's electric lights for Ford cars

steering column consists in the use of the brass wire which is wound around the column and the hole H1 in the plate P; this hole is also the point at which the lever L is attached, and around which it may be turned. As the gasoline saver is operated independently of the throttle, it may be brought into action at any time, and used either to increase the air in the fuel mixture after the throttle has been fully opened, or it may be applied as an air brake, when the car is coasting down a hill, with the throttle closed. As a much smaller throttle opening may be used in connection with the gas saver, the saving in fuel effected by its use is appreciable. Except for the tapping of the manifold no changes have to be made in installing the apparatus on an automobile.

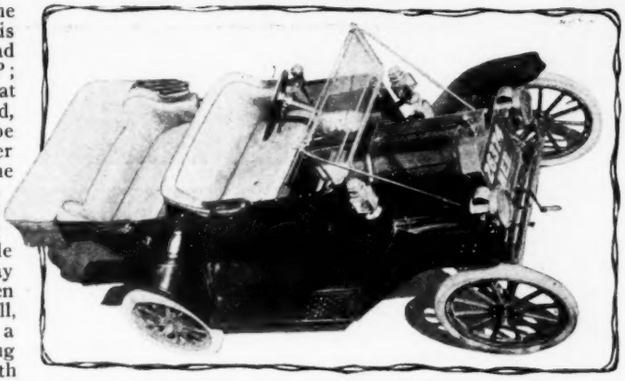


Fig. 6—Reynolds seat covers for Ford cars

Reynolds Seat Cover for Fords

To improve the appearance and to shield the seats of Ford cars against wear, the E. W. Reynolds Company, 713 South Fifteenth street, Omaha, Neb., has undertaken the manufacture of seat covers, Fig. 6. These covers are made of fine, dark brown material cut to fit any model T touring car.

Crary Gasoline Lock

A lock which is interposed in the gasoline line and which serves to shut off the flow of fuel from the tank to the carbureter, is made by the Crary Gasoline Lock Company. This device is illustrated in Figs. 8 and 9. It is a shut-off valve which has a turning play of about 90 degrees and is connected by a flexible shaft to the operating mechanism which may be installed in any suitable position on the dash or floor board. This control mechanism consists of a specially constructed Yale lock, Fig. 8. The valve itself is gas-tight and is said to absolutely prevent leakage of fuel or air. The device may be installed in any suitable position on the dash or floorboard of an automobile.

Holley Fuel Consumption Gauge

The amount of gasoline used per mile should be a point of interest to every automobilist, as it has a direct bearing upon his fuel bills. To enable automobilists to learn what amount of fuel is used by their motors for every mile, under various operating conditions, that is, on the level, on up or down grades, the Holly Brothers Company, Detroit, Mich., have developed the consumption indicator, Fig. 11. The latter consists of a narrow inverted funnel, supported by a frame which is secured to the car, and equipped with a glass gauge communicating with the interior of the funnel-shaped reservoir. In its use, the frame of the indicator is attached to a side-lamp bracket, or to any other suitable part of the dash, and the outlet of the tank which is controlled by a cock is connected to the gasoline supply pipe, while the line from the fuel tank is shut off. The tank is filled up until the floating ball in the standpipe disappears, after which the car is started and sped up to the velocity at which it is desired to make the test. When the ball becomes visible, the odometer is set to zero and the car is run, until the meter registers 1 mile. Now the motor is stopped and the amount of gasoline consumed noted on the indicator scale.

Azadian Line of Indicators

A line of various indicator gauges for use on automobiles are manufactured by the Azadian Gauge Manufacturing Company, Syracuse, N. Y. The line includes water, gasoline, oil, pressure and tires gauges, and a representative product is shown in Fig. 10, this being the Azadian tire gauge.

Burke Minimum-Work Tire Valve

The Burke Valve Company, Cleveland, O., manufactures the tire valve, Fig. 7, which is so constructed as to permit of easy infllation, without the exertion of waste effort. This waste effort, so-called, is the pressure necessary to unseat the ordinary tire valve by compressing the spring holding it to its seat. Assuming the spring pressure against the seat to be 40 pounds, it takes an effort of 40 pounds every time the spring is unseated; in other words, if an ordinary hand pump with a stroke of 1 foot is used for inflation and if a tire is filled with 100 strokes of this pump, 4,000 foot-pounds (.125 horsepower) of work must be spent in opening the valve to permit of all the necessary air being forced into the inner tube. The peculiar construction of the Burke valve is claimed to overcome this evil completely. As Fig. 7 shows, the valve consists of the stem S, which is threaded internally for the valve and externally for the dust cap. The valve mechanism proper consists of a stud V, one end of which is formed as the valve seat designed to retain the valve W. This valve is composed of a plunger, shaped as a piston with air passage through it, which has a reversible rubber valve R at its end; when the latter bears against the sharp edged end of the stud S, the valve is sealed against the internal tire pressure.

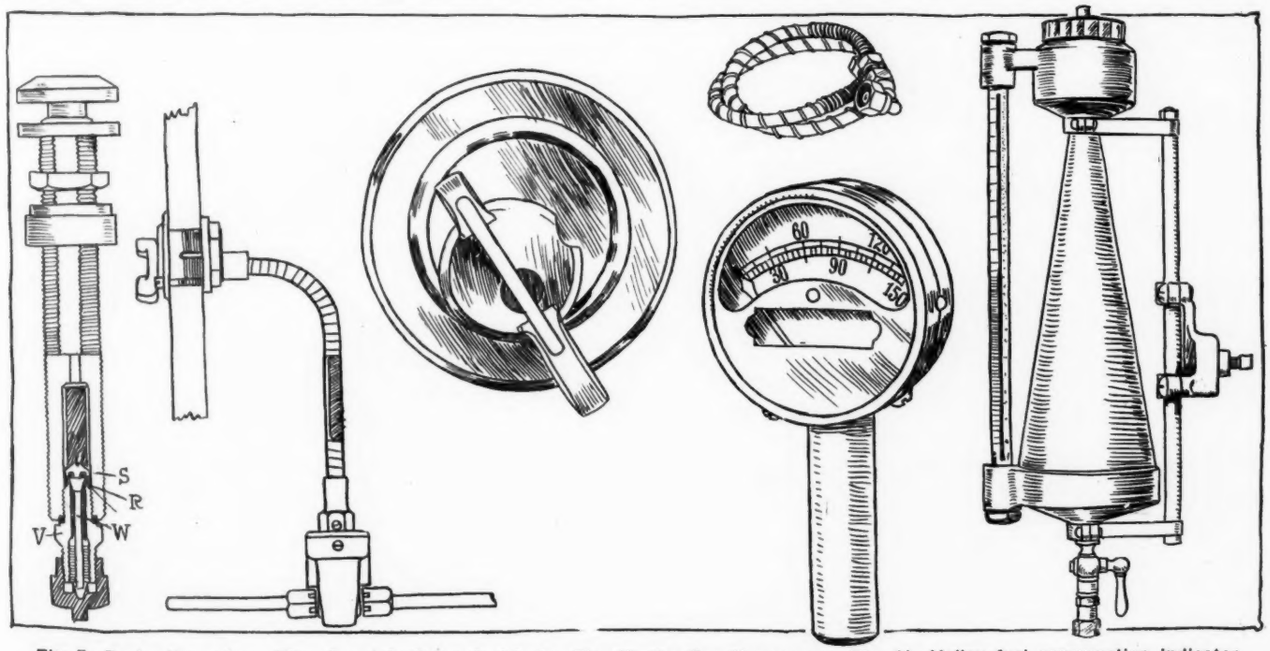


Fig. 7—Burke tire valve. Figs. 8 and 9—Crary fuel lock. Fig. 10—Azadian tire gauge. Fig. 11—Holley fuel consumption indicator

AUTOMOBILE SEARCHLIGHT—Having an auxiliary reflector which prevents the loss of light.

The patent refers to a construction as the one shown in Fig. 1, where a main parabolic reflecter R serves to produce a parallel beam of light. In front of the reflector is a burner B emitting the light which is concentrated by the reflector R. An auxiliary reflector R1 in axial alignment with R and positioned in front of B; this auxiliary reflector consists of a double convex lens L, the side remote from the burner being silvered so as to throw all the light it receives back upon R.

No. 1,044,252—to Henry Salesbury and Thomas Whitaker, London, Eng. Granted November 12, 1912; filed July 15, 1908.

Valve Truing Tool—Including a support permitting of free lateral motion.

The subject matter of this patent is a valve-truing device, Fig. 2, which consists of supporting means S for the extreme end of the valve stem, a tool T for grinding the beveled face of the valve and a support S1 for this tool which is formed with a passage P, permitting of free lateral motion of the valve.

No. 1,044,254—to Allan C. Sargent, Westford, Mass. Granted November 12, 1912; filed November 1, 1911.

Shock Absorber—Using an inflated bag in combination with a leaf spring suspension.

This patent refers to an automobile shock absorber which has an elliptical frame F, Fig. 4, including a number of hinged sections S, the adjacent ends E of which are reduced in width. Top and bottom stretches of the frame F are channeled longitudinally at their inner sides, and an inflated bag B positioned between the elliptical frame seats in the channeled portions of the same.

No. 1,043,820—to George S. Foster, Pueblo, Colo. Granted November 12, 1912; filed October 21, 1911.

Muffler Construction—Comprising a circuitous, open pipe, into which the exhaust pipe of the motor discharges and into which air is sucked from outside, thereby silencing the exhaust.

The subject matter of this patent, Fig. 3, is a muffler for internal-combustion motors constructed on a very simple principle. The waste gases leaving the motor by way of the exhaust pipe E are silenced by passing through the circuitous pipe P, which is of substantially equal cross section throughout its length and open at its ends P1 and P2. These open ends are in alignment and arranged with a gap between them; the outlet end E1 of the exhaust pipe E opens into the inlet end P1 of the pipe P, while the outlet end P2 of the latter opens somewhat in the rear of E1. In the wall of the circuitous pipe, inwardly opening check valves are provided which are not shown in Fig. 4, and which open in response to the vacuum created in P by the exhaust gases rushing through it. The mixture of the air and exhaust gases brings about the muffling of the latter.

No, 1,044,157—to Paul Fehde, Berlin, Germany. Granted November 12, 1912; filed July 5, 1911.

Internal-Combustion Motor—In which the valves are actuated from a rocker shaft mounted between two rows of cylinders served thereby.

The internal-combustion motor described in this patent, Fig. 5, comprises a crankcase in which a crankshaft is journaled, carrying connecting rods, the upper ends of which are fastened to pistons which travel in the cylinders C and C1. The latter are arranged in V-manner immediately above the crankcase, with an upwardly divergent gap between them. At the upper ends of the cylinders valve chambers V and V1 are formed, rigidly with C and C1, respectively. These chambers are in rigid relation to the cylinders and formed with seats and directly opposite openings O, which are closed by plugs. Between the inner walls of the valve chambers and the inner upper ends of the cylinders a valve-gear chamber G is formed; a camshaft S is journaled in the lower portion of G, and a rocker-arm shaft above it on which rocker arms A are mounted. Valves W and W1 engage the valve seats formed in the chambers V and V1, respectively, and their stems are engaged by the rocker arms A which operate the valves by a trip hammer motion.

No. 1,044,198—to Alphonse Joseph Lavoie, Outremont, Quebec, Can.. Granted November 12, 1912; filed August 21, 1911.

Hydraulic Clutch Construction—The rotor used in this mechanism is mounted eccentrically and is shaped with radial impelling blades.

The subject matter of this patent is a hydraulic clutch including a casing which forms a fluid chamber, the latter containing an eccentrically mounted rotary piston. Radial blades are slidably mounted in the piston, and project at opposite sides thereof, against which resilient rings are loosely fitted. These rings act on the projecting portions of the blades. A conduit is formed in the casing, adjacent to the principal chamber formed in it and connected to it at spaced points, the capacity of this conduit being variable by the operator of the device.

No. 1,043,617—to Horward L. Manley, Kansas City, Mo. Granted November 5, 1912; filed January 15, 1912.

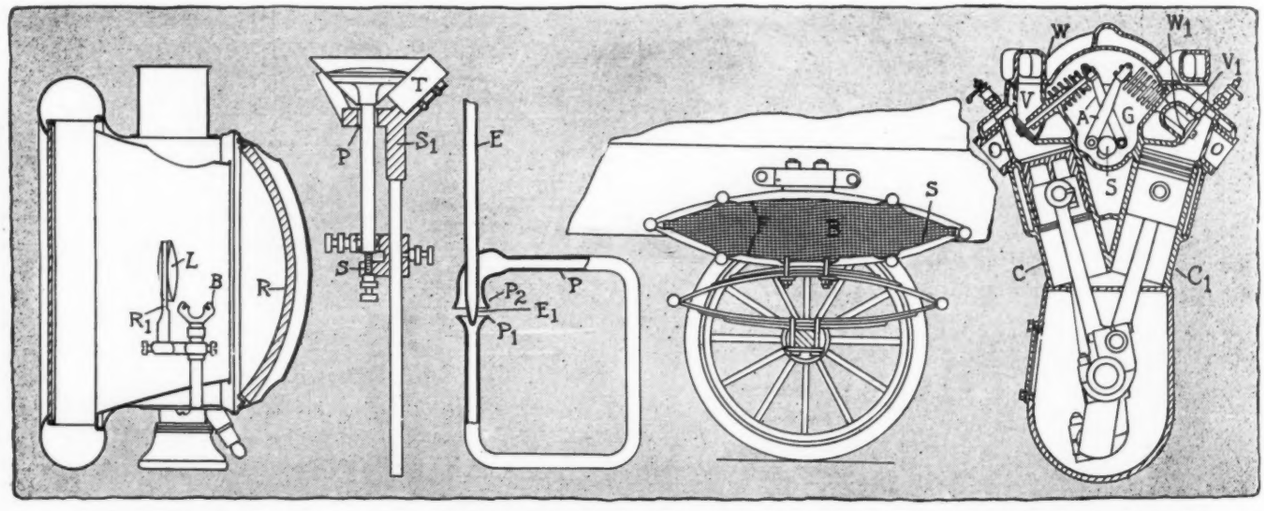


Fig. 1—Salesbury-Whitaker reflector. Fig. 2—Sargent valve tool. Fig. 3—Fehde muffler. Fig. 4—Foster shock absorber. Fig. 5—Lavoie V-type motor